```
=> fil reg
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STRUCTURE FILE UPDATES:   26 JUL 2005  HIGHEST RN 857144-48-0
DICTIONARY FILE UPDATES:  26 JUL 2005  HIGHEST RN 857144-48-0

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TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

  Please note that search-term pricing does apply when
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*************************************************************************
*                                                                       *
* The CA roles and document type information have been removed from     *
* the IDE default display format and the ED field has been added,       *
* effective March 20, 2005.  A new display format, IDERL, is now        *
* available and contains the CA role and document type information.     *
*                                                                       *
*************************************************************************

Structure search iteration limits have been increased.  See HELP SLIMITS
for details.

Experimental and calculated property data are now available. For more
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=> fil uspatfull
FILE 'USPATFULL' ENTERED AT 10:59:23 ON 27 JUL 2005
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FILE COVERS 1971 TO PATENT PUBLICATION DATE: 26 Jul 2005 (20050726/PD)
FILE LAST UPDATED: 26 Jul 2005 (20050726/ED)
HIGHEST GRANTED PATENT NUMBER: US6922846
HIGHEST APPLICATION PUBLICATION NUMBER: US2005160510
CA INDEXING IS CURRENT THROUGH 26 Jul 2005 (20050726/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 26 Jul 2005 (20050726/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2005
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2005

>>>  USPAT2 is now available.  USPATFULL contains full text of the     <<<
>>>  original, i.e., the earliest published granted patents or         <<<
>>>  applications.  USPAT2 contains full text of the latest US         <<<
>>>  publications, starting in 2001, for the inventions covered in     <<<
>>>  USPATFULL.  A USPATFULL record contains not only the original     <<<
>>>  published document but also a list of any subsequent              <<<
>>>  publications.  The publication number, patent kind code, and      <<<
>>>  publication date for all the US publications for an invention     <<<
>>>  are displayed in the PI (Patent Information) field of USPATFULL   <<<
>>>  records and may be searched in standard search fields, e.g., /PN, <<<
>>>  /PK, etc.                                                         <<<
```

>>> USPATFULL and USPAT2 can be accessed and searched together <<<
>>> through the new cluster USPATALL. Type FILE USPATALL to <<<
>>> enter this cluster. <<<
>>> <<<
>>> Use USPATALL when searching terms such as patent assignees, <<<
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=> fil uspat2
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FILE COVERS 2001 TO PUBLICATION DATE: 26 Jul 2005 (20050726/PD)
FILE LAST UPDATED: 26 Jul 2005 (20050726/ED)
HIGHEST GRANTED PATENT NUMBER: US2005131306
HIGHEST APPLICATION PUBLICATION NUMBER: US2005160493
CA INDEXING IS CURRENT THROUGH 26 Jul 2005 (20050726/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 26 Jul 2005 (20050726/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2005
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2005

USPAT2 is a companion file to USPATFULL. USPAT2 contains full text of the latest US publications, starting in 2001, for the inventions covered in USPATFULL. USPATFULL contains full text of the original published US patents from 1971 to date and the original applications from 2001. In addition, a USPATFULL record for an invention contains a complete list of publications that may be searched in standard search fields, e.g., /PN, /PK, etc.

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FILE COVERS 1907 - 27 Jul 2005 VOL 143 ISS 5
FILE LAST UPDATED: 26 Jul 2005 (20050726/ED)

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=> fil hcap
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FILE LAST UPDATED: 26 Jul 2005 (20050726/ED)

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=> fil medlin
FILE 'MEDLINE' ENTERED AT 10:59:37 ON 27 JUL 2005

FILE LAST UPDATED: 26 JUL 2005 (20050726/UP). FILE COVERS 1950 TO DATE.

On December 19, 2004, the 2005 MeSH terms were loaded.

The MEDLINE reload for 2005 is now available. For details enter HELP RLOAD at an arrow promt (=>). See also:

http://www.nlm.nih.gov/mesh/
http://www.nlm.nih.gov/pubs/techbull/nd04/nd04_mesh.html

OLDMEDLINE now back to 1950.

MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2005 vocabulary.

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=> fil biosis
FILE 'BIOSIS' ENTERED AT 10:59:41 ON 27 JUL 2005
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FILE COVERS 1969 TO DATE.
CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNs) PRESENT
FROM JANUARY 1969 TO DATE.

RECORDS LAST ADDED: 21 July 2005 (20050721/ED)

FILE RELOADED: 19 October 2003.

=> fil pascal
FILE 'PASCAL' ENTERED AT 10:59:44 ON 27 JUL 2005
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FILE COVERS 1977 TO DATE.

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=> fil jicst
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FILE COVERS 1970 TO DATE.

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<<< SOME LITTLE CHANGES IN TEXT OF CLASSIFICATION AS OF JUNE 13, 2005
SEE HELP CLA >>>

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```
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FILE LAST UPDATED:          25 JUL 2005      <20050725/UP>
MOST RECENT DERWENT UPDATE:     200547        <200547/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE,
    PLEASE VISIT:
 http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE
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>>> FOR INFORMATION ON ALL DERWENT WORLD PATENTS INDEX USER
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>>> NEW! FAST-ALERTING ACCESS TO NEWLY-PUBLISHED PATENT
    DOCUMENTATION NOW AVAILABLE IN DERWENT WORLD PATENTS INDEX
    FIRST VIEW - FILE WPIFV.
    FOR FURTHER DETAILS: http://www.thomsonderwent.com/dwpifv  <<<

>>> THE CPI AND EPI MANUAL CODES HAVE BEEN REVISED FROM UPDATE 200501.
    PLEASE CHECK:
http://thomsonderwent.com/support/dwpiref/reftools/classification/code-revision/
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=> fil conf
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FILE LAST UPDATED: 22 JUL 2005       <20050722/UP>
FILE COVERS 1976 TO DATE.

=> fil confsci
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FILE COVERS 1973 TO 25 May 2005 (20050525/ED)

=> file stnguide
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```

```
=> d que l56
L7              QUE  ABB=ON  PLU=ON  ?CENTRIFUG? OR ?CENTRIPET? OR ?CYCLO
                N? OR ?CIRCULAT?
L8              1 SEA FILE=REGISTRY ABB=ON  PLU=ON  107-06-2/RN
L9          13833 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8
L10           965 SEA FILE=HCAPLUS ABB=ON  PLU=ON  107-06-2P?
L11           965 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9 (L) (PREP+NT)/RL
L12             QUE  ABB=ON  PLU=ON  ?PREP? OR ?SYNTH? OR ?PRODUC? OR FOR
                M? OR YIELD?
L13          2587 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9(L) L12
L14          1723 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 (L) (PROC+NT)/RL
L15          4330 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10 OR L11 OR (L13 OR L14)
L16         18990 SEA FILE=HCAPLUS ABB=ON  PLU=ON  CHLORINATION/CT
L17           321 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 AND L16
L19        280481 SEA FILE=HCAPLUS ABB=ON  PLU=ON  REACTORS+PFT,NT/CT
L20          2154 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "SEPARATORS (L) CYCLONES"+PFT,
                NT/CT
L21          2508 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "CYCLONE SEPARATORS"+PFT,NT/CT

L22            24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 AND (L19 OR L20 OR L21)
L23             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  7782-50-5/RN
L30          5786 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "CHLORINE, REACTIONS"/OBI
L32         10938 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 (L) REACTION?
L33         10216 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 (L) (RACT+NT)/RL
L34            80 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 AND (L30 OR L32 OR L33)
L35             8 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND L19
L36             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND (L20 OR L21)
L37            23 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L30 OR L32 OR L33)(L)L7
L38             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND L37
L39             8 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L35 OR L36) OR L38
L45         25129 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (?CHLOROALKANE/OBI OR
                ?CHLOROALKYLENE/OBI OR ?CHLOROPARAFFIN/OBI OR ((?CHLORO/OBI OR
                ?CHLORINAT?/OBI) (2A) (ALKANE/OBI OR ALKYLENE/OBI OR PARAFFIN/O
                BI OR ETHANE/OBI OR ETHYLENE/OBI))) OR ((ALKANE/OBI OR
                ALKYLENE/OBI OR PARAFFIN/OBI)(1W) ?CHLORIDE/OBI)
L46           915 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 (L) (PREP+NT)/RL
L47           563 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 (L) (PROC+NT)/RL
L48          3578 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 (L) L12
L49           565 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L46 OR L47 OR L48) AND (L16
                OR L30 OR L32 OR L33)
L50            29 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 AND L19
L51             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 AND ((L20 OR L21))
L52             4 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 AND (L45 (L) L7)
L53            30 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L50 OR L51 OR L52)
L54            40 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L39 OR L22 OR L53
L55            23 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L54 NOT (ELECTROCHEMICAL OR
                "ELECTRO-ORGANIC" OR OXYCHLORINATION OR HYDROXYCHLORINATION OR
                "TWO-STAGE" OR ELECTROLYTICALLY OR ELASTOMERS)/TI
L56            20 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L55 AND (AY<2003 OR PY<2003
                OR PRY<2003)


=> d his l68

     (FILE 'USPATFULL, USPAT2' ENTERED AT 09:54:47 ON 27 JUL 2005)
L68            18 S L67 AND (AY<2003 OR PY<2003 OR PRY<2003)

=> d que l68
L8              1 SEA FILE=REGISTRY ABB=ON  PLU=ON  107-06-2/RN
L23             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  7782-50-5/RN
```

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L58         1276 SEA L8
L59         7316 SEA L23
L60           59 SEA L58 AND L59
L63         1506 SEA CHLORINATION/CT
L66           25 SEA L60 AND L63
L67           19 SEA L66 NOT (OXYHALOGENATION OR ETHYLENEOXICHLORINATION OR
                 SULPHONIC OR EFFLUENT)/TI
L68           18 SEA L67 AND (AY<2003 OR PY<2003 OR PRY<2003)


=> d que l77
L70          193 SEA FILE=WPIX ABB=ON  PLU=ON  C07C019-045?/IPC
L71          456 SEA FILE=WPIX ABB=ON  PLU=ON  C07C017-02/IPC
L72          344 SEA FILE=WPIX ABB=ON  PLU=ON  E10-H03C4/MC
L73           70 SEA FILE=WPIX ABB=ON  PLU=ON  L70 AND L71
L74           42 SEA FILE=WPIX ABB=ON  PLU=ON  L73 AND L72
L75           15 SEA FILE=WPIX ABB=ON  PLU=ON  L74 AND (?CENTRIFUG?/BIX OR
                 ?CENTRIPET?/BIX OR ?CYCLON?/BIX OR ?CIRCULAT?/BIX)
L76           13 SEA FILE=WPIX ABB=ON  PLU=ON  L75 NOT (OXYCHLORINAT?)/TI
L77           13 SEA FILE=WPIX ABB=ON  PLU=ON  L76 AND (AY<2003 OR PY<2003 OR
                 PRY<2003)


=> d his l96

     (FILE 'BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' ENTERED AT
     10:41:28 ON 27 JUL 2005)
L96           18 S L95 AND (AY<2003 OR PY<2003 OR PRY<2003 OR MY<2003)

=> d que l96
L4                QUE  ABB=ON  PLU=ON  ?CHLOROETHANE OR ?CHLOROETHYLENE? OR
                   (?CHLORO(1W)(ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLEN
                  E)(1W) ?CHLORIDE)
L7                QUE  ABB=ON  PLU=ON  ?CENTRIFUG? OR ?CENTRIPET? OR ?CYCLO
                  N? OR ?CIRCULAT?
L12               QUE  ABB=ON  PLU=ON  ?PREP? OR ?SYNTH? OR ?PRODUC? OR FOR
                  M? OR YIELD?
L79         28045 SEA L4
L80          1871 SEA L79 (5A) L12
L82         92223 SEA CHLORINAT? OR HALOGENAT?
L84           388 SEA L80 AND L82
L85            13 SEA L84 AND L7
L86             3 SEA L85 AND CHLORINATION/TI
L88          2393 SEA L82 (5A) (ETHANE OR ETHYLENE OR ETHENE)
L89            29 SEA L88 AND L7
L90           456 SEA L82 (3A) DIRECT?
L91            26 SEA L88 AND L90
L92            52 SEA L89 OR L91
L93            52 SEA L86 OR L92
L94            37 DUP REM L93 (15 DUPLICATES REMOVED)
L95            21 SEA L94 NOT (GROUNDWATER OR MARROW OR ALLOY OR SERUM OR
                  ENZYMES OR SCLERODERMA OR COMETABOLIC OR B12 OR BLOOD OR
                  AEROBIC OR ANAEROBIC OR RAT OR FISH OR TOXICANTS)/TI
L96           18 SEA L95 AND (AY<2003 OR PY<2003 OR PRY<2003 OR MY<2003)


=> dup rem l56 l68 l77 l96
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PROCESSING COMPLETED FOR L56
PROCESSING COMPLETED FOR L68
PROCESSING COMPLETED FOR L77
PROCESSING COMPLETED FOR L96
L109 64 DUP REM L56 L68 L77 L96 (5 DUPLICATES REMOVED)
ANSWERS '1-20' FROM FILE HCAPLUS
ANSWERS '21-37' FROM FILE USPATFULL
ANSWERS '38-47' FROM FILE WPIX
ANSWER '48' FROM FILE BIOSIS
ANSWERS '49-54' FROM FILE PASCAL
ANSWER '55' FROM FILE JICST-EPLUS
ANSWERS '56-62' FROM FILE COMPENDEX
ANSWERS '63-64' FROM FILE SCISEARCH

=> file stnguide
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=> d ibib ed ab hitind
YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' - CONTINUE? (Y)/N:y

L109 ANSWER 1 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 2
ACCESSION NUMBER: 2003:238167 HCAPLUS
DOCUMENT NUMBER: 138:256909
TITLE: Procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene**
INVENTOR(S): Benje, Michael; Jaculi, Dieter; Mielke, Ingolf; Schwarzmaier, Peter; Krejci, Klaus; Schubert, Joachim; Ertl, Horst
PATENT ASSIGNEE(S): Vinnolit Technologie G.m.b.H. & Co.K.-G. Werk Gendorf, Germany; Uhde Gmbh
SOURCE: Ger., 6 pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10207217	C1	20030327	DE 2002-10207217	20020221 <--
WO 2003070673	A1	20030828	WO 2003-EP1000	20030201 <--
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1476411	A1	20041117	EP 2003-706408	20030201 <--
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				

PRIORITY APPLN. INFO.: DE 2002-10207217 A 20020221 <--
WO 2003-EP1000 W 20030201

ED Entered STN: 27 Mar 2003
AB A procedure for the production of high-purity 1,2-dichloroethane where ethylene and chlorine are supplied to the reaction medium and a chlorine-containing gas flow is brought into a part of the reaction medium solution which is essentially free of dissolved ethylene and the undissolved gaseous components are removed from this solution by means of a centrifugation device for gas separation from the solution A process flow diagram
is presented.
IC ICM C07C017-02
ICS C07C019-045
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 48
IT **Chlorination**
(apparatus; procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene**)
IT **Reactors**

(chlorination apparatus; procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene**)

IT **Chlorination**
(procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene**)

IT **Cyclone separators**
(procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene** using)

IT **107-06-2P**, 1,2-Dichloroethane, **preparation**
RL: **EPR (Engineering process)**; **IMF (Industrial manufacture)**; **PEP (Physical, engineering or chemical process)**; **PREP (Preparation)**; **PROC (Process)**
(procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene**)

IT 74-85-1, Ethylene, reactions
RL: **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)
(procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene**)

IT **7782-50-5**, **Chlorine**, **reactions**
RL: **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; **RCT (Reactant)**; **RGT (Reagent)**; **PROC (Process)**; **RACT (Reactant or reagent)**
(procedure for the **production** of 1,2-dichloroethane by means of the direct **chlorination** of **ethylene**)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d ibib ed ab hitind 2-20
YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' - CONTINUE? (Y)/N:y

L109 ANSWER 2 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 3
ACCESSION NUMBER: 2002:185042 HCAPLUS
DOCUMENT NUMBER: 136:249367
TITLE: Method for producing 1,2-dichloroethane and apparatus for its implementation
INVENTOR(S): Shishkin, Zinovy Alexeevich; Samsonov, Valery Viktorovich; Mubarakov, Rifgat Gusmanovich; Kuznetsov, Anatoly Makarovich; Kharitonov, Valery Iosifovich; Medvedev, Yury Ivanovich; Pulyaevsky, Nikolay Lavrentjevich
PATENT ASSIGNEE(S): Obshchestvo s Ogranichennoi Otvetstvennostiju "Inis", Russia
SOURCE: PCT Int. Appl., 18 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002020443	A1	20020314	WO 2001-RU93	20010227 <--

W: AU, BR, CA, CN, DE, ES, GB, ID, IN, JP, KR, SG, TR, UA, US

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR

RU 2186759	C2	20020810	RU 2000-123451		20000911 <--
AU 2001048934	A5	20020322	AU 2001-48934		20010227 <--
PRIORITY APPLN. INFO.:			RU 2000-123451	A	20000911 <--
			WO 2001-RU93	W	20010227 <--

ED Entered STN: 15 Mar 2002

AB The invention relates to chemical engineering and can be used for producing 1,2-dichloroethane by means of direct chlorination of ethylene in liquid dichloroethane. The aim of said invention is to increase the ratio of ethylene and the selectivity of the chlorine and ethylene reaction. The inventive method is carried out with the aid of a reactor which comprises a body (1) and a central reaction tube (2). Gas lifting circulation of a liquid dichloroethane flow is carried out in a vertical circulating circuit which has an estimated flow Q excluding ebullition of the dichloroethane in the reaction zone (5). The gaseous chlorine and ethylene are introduced into the reactor through distribution jets (4) and (6) arranged in the tube (2). The gaseous chlorine and ethylene are predispersed in the liquid dichloroethane and introduced with the aid of nosepieces (11) and (12) ejectors. The liquid dichloroethane is introduced into an inlet chamber of each ejector having a flow rate Q1 which is equal to 0.01-0.2 of the estimated flow Q of the liquid circulating dichloroethane.

IC ICM C07C017-02
ICS C07C019-045

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 48

ST dichloroethane **prepn ethylene chlorination** app

IT **Chlorination**
(apparatus; method of **producing** 1,2-dichloroethane by the gas-phase **chlorination** of **ethylene** and an apparatus for its implementation)

IT **Reactors**
(chlorination apparatus; method of **producing** 1,2-dichloroethane by the gas-phase **chlorination** of **ethylene** and an apparatus for its implementation)

IT **107-06-2P**, 1,2-Dichloroethane, **preparation**
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(method of **producing** 1,2-dichloroethane by the gas-phase **chlorination** of **ethylene** and an apparatus for its implementation)

IT 74-85-1, Ethylene, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(method of **producing** 1,2-dichloroethane by the gas-phase **chlorination** of **ethylene** and an apparatus for its implementation)

IT 1300-21-6, Dichloroethane
RL: NUU (Other use, unclassified); USES (Uses)
(reaction medium; method of **producing** 1,2-dichloroethane by the gas-phase **chlorination** of **ethylene** and an apparatus for its implementation)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L109 ANSWER 3 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 4
ACCESSION NUMBER: 2001:228838 HCAPLUS
DOCUMENT NUMBER: 134:254016
TITLE: Method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of **ethylene**

INVENTOR(S): Motz, Joachim
PATENT ASSIGNEE(S): Krupp Uhde G.m.b.H., Germany
SOURCE: PCT Int. Appl., 19 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001021564	A1	20010329	WO 2000-EP8963	20000914 <--
W: JP, NO, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
DE 10037323	A1	20010412	DE 2000-10037323	20000729 <--
EP 1214279	A1	20020619	EP 2000-966000	20000914 <--
EP 1214279	B1	20040526		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY				
JP 2003509480	T2	20030311	JP 2001-524946	20000914 <--
AT 267788	E	20040615	AT 2000-966000	20000914 <--
NO 2002001393	A	20020320	NO 2002-1393	20020320 <--
US 6693224	B1	20040217	US 2002-70842	20020522 <--
US 2004059166	A1	20040325	US 2003-670970	20030925 <--

PRIORITY APPLN. INFO.:			
DE 1999-19945355	A	19990922 <--
DE 2000-10037323	A	20000729 <--
WO 2000-EP8963	W	20000914 <--
US 2002-70842	A1	20020522 <--

ED Entered STN: 30 Mar 2001

AB A method for the production of 1,2-dichlorethane (I) by direct chlorination using chlorine and ethene in which, despite low reaction temps. during direct chlorination, reaction heat produced is nevertheless used. Vaporous I obtained in a direct chlorination reactor is compressed and transported to heat exchangers where heat is given off by the I. A turbocompressor, for compressing, is arranged directly after the direct chlorination reactor.

IC ICM C07C017-02
ICS C07C019-045

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 47, 48

IT **Chlorination**
(apparatus; method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of **ethylene**)

IT **Reactors**
(chlorination apparatus; method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of **ethylene**)

IT Heat exchangers
(method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of **ethylene**)

IT Compressors
(turbine; method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of **ethylene**)

IT Distillation columns
(vacuum; method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of

ethylene)
IT **107-06-2P**, 1,2-Dichloroethane, **preparation**
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of **ethylene**)
IT 74-85-1, Ethene, reactions **7782-50-5**, **Chlorine**, **reactions**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(method and device for utilizing heat in the **production** of 1,2-dichloroethane by the direct **chlorination** of **ethylene**)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L109 ANSWER 4 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN DUPLICATE 5
ACCESSION NUMBER: 2001:128777 HCAPLUS
DOCUMENT NUMBER: 134:354785
TITLE: Model evaluation for an industrial process of direct **chlorination** of **ethylene** in a bubble-column reactor with external **recirculation** loop
AUTHOR(S): Orejas, J. A.
CORPORATE SOURCE: Ruta Nac. 36, Facultad de Ingenieria, Universidad Nacional de Rio Cuarto, Rio Cuarto, 5800, Argent.
SOURCE: Chemical Engineering Science (**2001**), 56(2), 513-522
CODEN: CESCAC; ISSN: 0009-2509
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 21 Feb 2001
AB An industrial process for the direct chlorination of ethylene at low temps. to yield 1,2-dichloroethane has been considered. The reactor, whose configuration corresponds to a bubble column with external recirculation loop, has a working capacity of 19 m3 and a production capacity of 54 000 tons of 1,2-dichloroethane per yr. In order to describe its operation, the predictions from a model developed in a previous work were evaluated using a special anal. of exptl. data. This enables one to obtain both a model and a numerical simulation program which not only predict various performance variables with satisfactory relative errors but also have the capacity of representing the influence of changes in operating conditions adequately within the entire tech. feasible operating range.
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
IT **Chlorination**
Reactors
Simulation and Modeling, physicochemical
(modeling of direct **chlorination** of **ethylene** in bubble-column reactor with external **recirculation** loop)
IT **107-06-2P**, 1,2-Dichloroethane, **preparation**
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(modeling of direct **chlorination** of **ethylene** in bubble-column reactor with external **recirculation** loop)
IT 74-85-1, Ethylene, reactions
RL: **PEP (Physical, engineering or chemical process)**; RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)
(modeling of direct **chlorination** of **ethylene** in bubble-column reactor with external **recirculation** loop)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L109 ANSWER 5 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:784491 HCAPLUS
DOCUMENT NUMBER: 140:6402
TITLE: Reactor for direct chlorination of ethylene
INVENTOR(S): Shishkin, Z. A.; Samsonov, V. V.; Kuznetsov, A. M.; Medvedev, Yu. I.; Novitskii, E. A.
PATENT ASSIGNEE(S): Obshchestvo s Ogranichennoi Otvetstvennost'yu "INIS", Russia
SOURCE: Russ., No pp. given
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2209111	C1	20030727	RU 2002-109341	20020410 <--
PRIORITY APPLN. INFO.:			RU 2002-109341	20020410 <--

ED Entered STN: 07 Oct 2003
AB The reactor has a vertical hermetic housing which has a reaction zone with an ascending flow of 1,2-dichloroethane (I), a circulation zone with a descending flow of I, and a separation zone of liquid and vapor phases of I; all the zones are connected; the reactor is also provided with Cl2 and ethylene distributors located in a lower portion of the reaction zone, hydraulic resistances, inlets for Cl2, ethylene, and recycled I and an outlet for I. The reaction zone is made in form of ≥2 sep. reaction sections. The cross-sectional area of each section is ≥10% of total area of the reaction zone. The total cross-sectional area of all reaction sections is equal to the total cross-sectional area of the reaction zone of the reactor. Each reaction section is provided with hydraulic resistances, and Cl2 and ethylene distributors and inlets. Each Cl2 and ethylene inlet is connected to resp. Cl2 and ethylene supply pipelines through a shutoff valve. The arrangement provides an enhanced efficiency and high selectivity of the process with a min. yield of toxic reaction products. The reactor is suitable for manufacture of I by high-temperature chlorination of gaseous ethylene in the presence of recirculated liquid I.
IC ICM B01J019-00
ICS B01J019-24; C07C017-00
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
IT **Reactors**
(for direct chlorination of ethylene in manufacture of ethylene chloride)
IT **Chlorination**
(of ethylene in manufacture of ethylene chloride)
IT **7782-50-5, Chlorine, reactions**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(for direct chlorination of ethylene in manufacture of ethylene chloride)
IT **107-06-2P**, 1,2-Dichloroethane, **preparation**
RL: DEV (Device component use); **IMF (Industrial manufacture)**; **PREP (Preparation)**; USES (Uses)
(reactor for direct **chlorination** of **ethylene** in manufacture of)

L109 ANSWER 6 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:622201 HCAPLUS
DOCUMENT NUMBER: 142:221603

TITLE: Process for preparation of perchloroethylenes
INVENTOR(S): Ichim, Horia; Statie, Luminita; Roibu, Constantin; Balint, Gheorghe; Cretu, Maria; Dumitrache, Florin
PATENT ASSIGNEE(S): S.C. Oltchim S.A., Ramnicu Valcea, Rom.
SOURCE: Rom., 6 pp.
CODEN: RUXXA3
DOCUMENT TYPE: Patent
LANGUAGE: Romanian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RO 117693	B1	20020628	RO 2000-825	20000814 <--
PRIORITY APPLN. INFO.:			RO 2000-825	20000814 <--

ED Entered STN: 04 Aug 2004
AB The chlorination of C1-C3 hydrocarbons and chloroalkanes with HCl/Cl2 is carried out by stepwise mixing the hydrocarbons/chloroalkanes/CCl4 at a first reaction zone of a reactor, removing CCl4 from the medium and adding HCl/Cl2 mixture at a second reaction zone to effect chlorination. The chloroalkane products are separated and a 15-25% fraction, containing 1,2-dichloroethane, is recycled into the first reaction zone to enhance dissoln. of reactants while excess HCl/Cl2 is also recirculated into the second reaction zone. The solvent and excess reagent recirculation ensures total closed-cycle operation conditions and minimizes CCl4 consumption.
IC ICM C07C021-04
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
ST **alkane chlorination chloroalkane recirculation** carbon tetrachloride use minimization process
IT Alkanes, reactions
RL: **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)
(C1-3; closed-cycle process for **chlorination** of **alkanes** with HCl/Cl2 with **product recirculation**/use as solvent for **preparation** of chloroalkanes)
IT **Chlorination**
(apparatus; closed-cycle process for **chlorination** of **alkanes** with HCl/Cl2 with **product recirculation**/use as solvent for **preparation** of chloroalkanes)
IT **Reactors**
(chlorination apparatus; closed-cycle process for **chlorination** of **alkanes** with HCl/Cl2 with **product recirculation**/use as solvent for **preparation** of chloroalkanes)
IT **Alkanes**, reactions
RL: **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)
(**chloro**, chloroalkanes; closed-cycle process for **chlorination** of **alkanes** with HCl/Cl2 with **product recirculation**/use as solvent for **preparation** of chloroalkanes)
IT **Chlorination**
(closed-cycle process for **chlorination** of **alkanes** with HCl/Cl2 with **product recirculation**/use as solvent for **preparation** of chloroalkanes)

IT 56-23-5P, Carbon tetrachloride, **preparation** **107-06-2P**, 1,2-Dichloroethane, **preparation** 127-18-4P, Perchloroethylene, **preparation**
RL: **EPR (Engineering process)**; **IMF (Industrial manufacture)**; NUU (Other use, unclassified); **PEP (Physical, engineering or chemical process)**; **PREP (Preparation)**; **PROC (Process)**; USES (Uses)
(closed-cycle process for **chlorination** of **alkanes** with HCl/Cl2 with **product recirculation**/use as solvent for **preparation** of chloroalkanes)

IT 7647-01-0, Hydrogen chloride, reactions **7782-50-5**, **Chlorine**, **reactions**
RL: **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; **RCT (Reactant)**; **PROC (Process)**; **RACT (Reactant or reagent)**
(closed-cycle process for **chlorination** of **alkanes** with HCl/Cl2 with **product recirculation**/use as solvent for **preparation** of chloroalkanes)

L109 ANSWER 7 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:693253 HCAPLUS
DOCUMENT NUMBER: 135:244062
TITLE: Chlorination method and reactor for producing 1,2-dichloroethane from chlorine and ethylene
INVENTOR(S): Samsonov, Valery Viktorovich; Shishkin, Zinovy Alexeevich; Mubarakov, Rifgat Gusmanovich; Kuznetsov, Anatoly Makarovich; Kharitonov, Valery Iosifovich; Medvedev, Jury Ivanovich
PATENT ASSIGNEE(S): Obshchestvo S Ogranichennoi Otvetstvennostiju "Inis", Russia
SOURCE: PCT Int. Appl., 19 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001068574	A1	20010920	WO 2000-RU506	20001208 <--
W: AT, BR, CA, CN, ES, GB, ID, IN, JP, KR, SG, TR, UA, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
RU 2162834	C1	20010210	RU 2000-106105	20000315 <--
PRIORITY APPLN. INFO.:			RU 2000-106105 A	20000315 <--

ED Entered STN: 21 Sep 2001
AB The production of dichloroethane with the aid of direct ethylene chlorination in liquid dichloroethane is described in a vertical two-column reactor which ensures a gas-lift circulation of the dichloroethane in a vertical circulating circuit supplied with chlorine and ethylene. A reactor diagram is presented.
IC ICM C07C019-045
ICS C07C017-02
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 47, 48
IT **Chlorination**
(apparatus, two-column; for producing 1,2-dichloroethane from chlorine and ethylene)
IT **Reactors**
(chlorination apparatus, two-column; for producing 1,2-dichloroethane from

chlorine and ethylene)
IT **Chlorination**
(for producing 1,2-dichloroethane from chlorine and ethylene)
IT 74-85-1, **Ethylene**, reactions **7782-50-5**, **Chlorine**, **reactions**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(**chlorination** method and reactor for **producing** 1,2-dichloroethane from chlorine and ethylene)
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L109 ANSWER 8 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:666684 HCAPLUS
DOCUMENT NUMBER: 133:237573
TITLE: Method of **producing** ethylene dichloride by catalytic **chlorination** of **ethylene** where the ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements **producing** gas bubbles of 0.3-3-millimeter diameter
INVENTOR(S): Benje, Michael
PATENT ASSIGNEE(S): Krupp Uhde G.m.b.H., Germany
SOURCE: PCT Int. Appl., 45 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000055107	A1	20000921	WO 1999-EP7649	19991012 <--
W: AL, AM, AU, AZ, BA, BB, BG, BR, BY, CA, CN, CU, CZ, EE, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
DE 19910964	A1	20000921	DE 1999-19910964	19990312 <--
AU 9964705	A1	20001004	AU 1999-64705	19991012 <--
EP 1161406	A1	20011212	EP 1999-952553	19991012 <--
EP 1161406	B1	20040421		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002539179	T2	20021119	JP 2000-605538	19991012 <--
AT 264827	E	20040515	AT 1999-952553	19991012 <--
PT 1161406	T	20040831	PT 1999-952553	19991012 <--
ES 2217824	T3	20041101	ES 1999-952553	19991012 <--
NO 2001004198	A	20010829	NO 2001-4198	20010829 <--
US 6841708	B1	20050111	US 2001-936335	20010912 <--
US 2005049444	A1	20050303	US 2004-961316	20041008 <--

PRIORITY APPLN. INFO.:			
DE 1999-19910964	A	19990312	<--
WO 1999-EP7649	W	19991012	<--
US 2001-936335	A3	20010912	<--

OTHER SOURCE(S): CASREACT 133:237573
ED Entered STN: 22 Sep 2000
AB 1,2-Dichloroethane is prepared in high yield and selectivity by using a circulating reaction medium and a catalyst (e.g., FeCl3) where the

catalytic chlorination of the ethylene in a manner that is especially gentle for the product. The ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements in order to produce gas bubbles with a diameter of 0.3-3 mm.

IC ICM C07C017-02

CC 23-3 (Aliphatic Compounds)
Section cross-reference(s): 45, 48

IT **Chlorination**
Chlorination
(apparatus; for manufacturing ethylene dichloride where the ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements producing gas bubbles with a diameter of 0.3-3 mm)

IT **Reactors**
Reactors
(chlorination apparatus; for manufacturing ethylene dichloride where the ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements producing gas bubbles with a diameter of 0.3-3 mm)

IT **Alkanes, preparation**
RL: **IMF (Industrial manufacture); PREP (Preparation)**
(**chloro**, 1,2-dichloroethane; process and apparatus for manufacture of)

IT Chlorination catalysts
(in the manufacture of ethylene dichloride by the catalytic **chlorination** of **ethylene** where the ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements **producing** small gas bubbles)

IT **Chlorination**
(method of **producing** ethylene dichloride by the catalytic **chlorination** of **ethylene** where the ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements **producing** small gas bubbles)

IT Bubbles
(**producing** 1,2-dichloroethane by catalytic **chlorination** of **ethylene** where the ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements **producing** gas bubbles of 0.3-3 mm diameter)

IT **107-06-2P**, 1,2-Dichloroethane, **preparation**
RL: **IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)**
(**producing** ethylene dichloride by catalytic **chlorination** of **ethylene** where the ethylene or chlorine gas is introduced into the reaction medium by means of microporous gas diffuser elements **producing** gas bubbles of 0.3-3-mm diameter)

IT 74-85-1, Ethylene, reactions **7782-50-5, Chlorine, reactions**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(**producing** ethylene dichloride by catalytic **chlorination** of **ethylene** where the ethylene or chlorine gas is introduced into the **reaction** medium by means of microporous gas diffuser elements **producing** gas bubbles of 0.3-3-mm diameter)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L109 ANSWER 9 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:32 HCAPLUS
DOCUMENT NUMBER: 136:39094
TITLE: Method and apparatus for the chlorination of paraffins with chlorine
INVENTOR(S): Balakirev, E. S.; D'yakonov, I. A.; Filimonov, V. A.; Il'in, B. A.
PATENT ASSIGNEE(S): Russia
SOURCE: Russ., No pp. given
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2153487	C2	20000727	RU 1998-116477	19980827 <--
PRIORITY APPLN. INFO.:			RU 1998-116477	19980827 <--

ED Entered STN: 31 Dec 2001
AB In the chlorination of paraffin hydrocarbons with gaseous chlorine, the chlorination is carried out in a continuous mode in a counterflow column sectionized reactor in the presence of process initiators. The counterflow reactor is composed of five sections provided with gas distributor, outer attached heat exchangers, and an overflow pipe for discharging the reaction mixture The diameter-to-height ratio of the sections is 1:2.2. The liquid phase is fed continuously from the reactor top and discharged from below. Reaction heat is taken off in the outer-attached heat exchanger of each section with the reaction mixture circulating naturally. Chlorination of the liquid paraffin hydrocarbons is conducted at 85-120° and atmospheric pressure, and the chlorination of solid paraffin hydrocarbons is carried out in carbon tetrachloride solution at 20-85° and 30-50 kPa higher than atmospheric pressure, thus making the equipment more efficient and production methods simpler.
IC ICM C07C017-10
ICS C07C019-01
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 47, 48
IT **Chlorination**
(apparatus, countercurrent; method and apparatus for the chlorination of alkanes)
IT **Reactors**
(chlorination apparatus, countercurrent; method and apparatus for the chlorination of alkanes)
IT **Alkanes, preparation**
Paraffin oils
Paraffin waxes, **preparation**
RL: **EPR (Engineering process)**; **IMF (Industrial manufacture)**; **PEP (Physical, engineering or chemical process)**; **PYP (Physical process)**; **PREP (Preparation)**; **PROC (Process)**
(**chloro**; method and apparatus for the **chlorination** of **alkanes**)
IT Alkanes, reactions
Paraffin oils
Paraffin waxes, reactions
RL: **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; **PYP (Physical process)**; RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)

(method and apparatus for the **chlorination** of **alkanes**)
IT **Chlorination**
(of paraffins)
IT **7782-50-5, Chlorine, reactions**
RL: **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; **PYP (Physical process)**; **RGT (Reagent)**; **PROC (Process)**; **RACT (Reactant or reagent)**
(method and apparatus for the **chlorination** of **alkanes** with)
IT 7647-01-0P, Hydrogen chloride, **preparation**
RL: **BYP (Byproduct)**; **EPR (Engineering process)**; **PEP (Physical, engineering or chemical process)**; **PYP (Physical process)**; **REM (Removal or disposal)**; **PREP (Preparation)**; **PROC (Process)**
(method and apparatus for the **chlorination** of **alkanes** with chlorine and **formation** of)
IT 56-23-5, Carbon tetrachloride, processes
RL: **EPR (Engineering process)**; NUU (Other use, unclassified); **PEP (Physical, engineering or chemical process)**; **PYP (Physical process)**; **PROC (Process)**; USES (Uses)
(solvent; method and apparatus for the **chlorination** of solid **alkanes** in)

L109 ANSWER 10 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:296825 HCAPLUS
DOCUMENT NUMBER: 136:281135
TITLE: Reactor for direct chlorination of ethylene
INVENTOR(S): Kats, M. B.; Abdrashitov, Ya. M.; Dmitriev, Yu. K.; Matalinov, V. I.; Berlin, E. R.; Yapryntsev, Yu. M.; Gorin, V. N.
PATENT ASSIGNEE(S): Zakrytoe Aktsionernoe Obshchestvo "Kaustik", Russia
SOURCE: Russ., No pp. given
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2153394	C1	20000727	RU 1999-102333	19990205 <--
PRIORITY APPLN. INFO.:			RU 1999-102333	19990205 <--

ED Entered STN: 22 Apr 2002
AB Construction of a reactor for direct chlorination of ethylene in production of 1,2-dichloroethane is described. The reactor has a cylindrical body, inlets for initial ethylene and chlorine, and outlets for dichloroethane condensate and gaseous reaction products. The reactor is separated with horizontal grates and has an internal circulation tube. The upper part of the circulation tube has perforations in the form of rectangular windows located along circumference of the circulation tube. Design of the reactor allows increased rate of ethylene chlorination and fine control of the chlorination process.
IC ICM B01J019-00
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 47
IT **Chlorination**
(apparatus; reactor for direct chlorination of ethylene)
IT **Reactors**
(chlorination apparatus; reactor for direct chlorination of ethylene)

IT **107-06-2P**, 1,2-Dichloroethane, **preparation**
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(reactor for direct **chlorination** of **ethylene** in **production** of)

L109 ANSWER 11 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:457397 HCAPLUS
DOCUMENT NUMBER: 133:45180
TITLE: Liquid-phase direct chlorination process and plant for the production of 1,2-dichlorethane from ethylene and chlorine
INVENTOR(S): Porscha, Peter
PATENT ASSIGNEE(S): Krupp Uhde G.m.b.H., Germany
SOURCE: Ger., 6 pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19916753	C1	20000706	DE 1999-19916753	19990414 <--
EP 1044950	A1	20001018	EP 2000-101148	20000121 <--
EP 1044950	B1	20030416		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2000319208	A2	20001121	JP 2000-108460	20000410 <--
NO 2000001909	A	20001016	NO 2000-1909	20000412 <--
US 6252125	B1	20010626	US 2000-549682	20000414 <--

PRIORITY APPLN. INFO.: DE 1999-19916753 A 19990414 <--
ED Entered STN: 07 Jul 2000
AB 1,2-Dichlorethan (I) is prepared in high yield and selectivity by the liquid-phase direct chlorination of ethylene with chlorine, where the I is separated in a vacuum distillation column from the bottoms product. An apparatus schematic is presented.
IC ICM C07C017-02
ICS C07C017-383; C07C019-045
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 47, 48
IT **Chlorination**
Chlorination
(apparatus; liquid-phase direct chlorination process plant for the production of 1,2-dichlorethane from ethylene and chlorine)
IT **Reactors**
Reactors
(chlorination apparatus; liquid-phase direct chlorination process plant for the production of 1,2-dichlorethane from ethylene and chlorine)
IT **Alkanes, preparation**
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(**chloro**, 1,2-dichlorethane; liquid-phase direct chlorination process and plant for the **production** of 1,2-dichlorethane from ethylene and chlorine)
IT **Chlorination**
(liquid-phase direct chlorination process for the production of 1,2-dichlorethane from ethylene and chlorine)
IT **107-06-2P**, 1,2-Dichlorethane, **preparation**
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**

(liquid-phase direct chlorination process and plant for the **prodn**
. of 1,2-dichlorethane from ethylene and chlorine)
IT 74-85-1, Ethene, reactions **7782-50-5**, **Chlorine**,
reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(liquid-phase direct chlorination process and plant for the production of
1,2-dichlorethane from ethylene and chlorine)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L109 ANSWER 12 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:452730 HCAPLUS
DOCUMENT NUMBER: 133:45593
TITLE: Method for controlling operation of reactor for direct chlorination of ethylene in medium of liquid dichloroethane
INVENTOR(S): Shishkin, Z. A.; Samsonov, V. V.; Kharitonov, V. I.; Mubarakov, R. G.; Kuznetsov, A. M.; Perevalov, A. F.; Medvedev, Yu. I.
PATENT ASSIGNEE(S): Ovatel'skii i Konstruktorskii Institut Khimicheskogo Mashinostroeniya", Russia
SOURCE: Russ. From: Izobreteniya 1998, (15), 243-44.
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2111788	C1	19980527	RU 1995-118995	19951109 <--
PRIORITY APPLN. INFO.:			RU 1995-118995	19951109 <--

ED Entered STN: 05 Jul 2000
AB Title only translated.
IC ICM B01J019-00
ICS G05D027-00
CC 48-10 (Unit Operations and Processes)
Section cross-reference(s): 45
IT **Chlorination**
Chlorination
(apparatus; method for controlling operation of reactor for direct chlorination of ethylene in medium of liquid dichloroethane)
IT **Reactors**
Reactors
(chlorination apparatus; method for controlling operation of reactor for direct chlorination of ethylene in medium of liquid dichloroethane)
IT **Chlorination**
Process control
(method for controlling operation of reactor for direct chlorination of ethylene in medium of liquid dichloroethane)
IT 74-85-1, Ethylene, processes 1300-21-6, Dichloroethane
RL: **PEP (Physical, engineering or chemical process)**; **PROC (Process)**
(method for controlling operation of reactor for direct **chlorination** of **ethylene** in medium of liquid dichloroethane)

L109 ANSWER 13 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1997:584446 HCAPLUS
DOCUMENT NUMBER: 127:177959

TITLE: Reactor for direct **chlorination** of **ethylene** in manufacture of dichloroethane and other **products**
INVENTOR(S): Samsonov, Valerij V.; Shishkin, Zinovij A.; Kharitonov, Valerij I.; Mubarakov, Rifgat G.; Kuznetsov, Anatolij M.; Kovalev, Vyacheslav N.
PATENT ASSIGNEE(S): Aktsionernoe Obshchestvo "sayanskkhimprom", USSR; Aktsionernoe Obshchestvo "irkutskij Nauchno-Issledovatelskij I Konstruktorskij Institut Khimicheskogo Mashinostroeniya"
SOURCE: Russ. From: Izobreteniya 1997, (8), 137. CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2075344	C1	19970320	RU 1993-46786	19930927 <--
PRIORITY APPLN. INFO.:			RU 1993-46786	19930927 <--

ED Entered STN: 13 Sep 1997
AB Title only translated.
IC ICM B01J019-00
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
IT **Reactors**
(for direct **chlorination** of **ethylene** in manufacture of dichloroethane and other **products**)
IT **Chlorination**
(reactor for direct **chlorination** of **ethylene** in manufacture of dichloroethane and other **products**)
IT 1300-21-6P, Dichloroethane
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(reactor for direct **chlorination** of **ethylene** in manufacture of)
IT 74-85-1, Ethylene, processes
RL: **PEP (Physical, engineering or chemical process)**; **PROC (Process)**
(reactor for direct **chlorination** of **ethylene** in manufacture of dichloroethane and other **products**)

L109 ANSWER 14 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1995:996748 HCAPLUS
DOCUMENT NUMBER: 124:90927
TITLE: Bubble column reactor for direct chlorination of ethylene
INVENTOR(S): Shishkin, Zinovij A.; Kharitonov, Valerij I.; Perevalov, Anatolij F.; Popov, Vladimir E.; Mubarakov, Rifgat G.; Kuznetsov, Anatolij M.
PATENT ASSIGNEE(S): Aktsionernoe Obshchestvo "Sayanskkhimprom", USSR
SOURCE: Russ. From: Izobreteniya 1995, (16), 102. CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2036716	C1	19950609	RU 1991-5020182	19910823 <--

PRIORITY APPLN. INFO.: SU 1991-5020182 A 19910823 <--
ED Entered STN: 22 Dec 1995
AB Title only translated.
IC ICM B01J019-24
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
IT **Chlorination**
(direct, of ethylene to dichloro- and trichloroethane; bubble column reactor for direct chlorination of ethylene)
IT **Reactors**
(bubble column, bubble column reactor for direct chlorination of ethylene)
IT 1300-21-6P, Dichloroethane 25323-89-1P, Trichloroethane
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(bubble column reactor for direct **chlorination** of **ethylene**)
IT 74-85-1, Ethylene, reactions
RL: **PEP (Physical, engineering or chemical process)**; RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)
(bubble column reactor for direct **chlorination** of **ethylene**)

L109 ANSWER 15 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1993:475083 HCAPLUS
DOCUMENT NUMBER: 119:75083
TITLE: An improved reactor for ethylene chlorination
INVENTOR(S): Shishkin, Zinovij A.; Kharitonov, Valerij I.; Perevalov, Anatolij F.; Popov, Vladimir E.; Mubarakov, Rifgat G.; Shestakov, Yurij M.; Sazonov, Aleksandr V.; Kuznetsov, Anatolij M.; Kiseleva, Irina I.; Sergeev, Yurij A.
PATENT ASSIGNEE(S): Ir ni k i khim mash, USSR; Sayanskoe proizv ob "khimprom"
SOURCE: U.S.S.R. From: Izobreteniya 1992, (37), 29.
CODEN: URXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
SU 1766486	A1	19921007	SU 1990-4851830	19900716 <--

PRIORITY APPLN. INFO.: SU 1990-4851830 19900716 <--
ED Entered STN: 21 Aug 1993
AB The title reactor comprises a vertical column with a centrally located circulation tube with perforated plates and distributors for Cl(g), ethylene, and liquid recirculated dichloroethane. Another (outer) circulation tube is mounted between the dichloroethane distributor and the lower perforated plate, coaxially with the 1st circulation tube. Cl(g) distributor is placed in the central cylindrical zone between the 2 coaxial circulation tubes and the addnl. spargers for ethylene are placed in the annular gap formed between the outer tube and the reactor wall. The latter spargers help to attain a complete dissoln. of ethylene and to reduce its consumption and formation of byproducts.
IC ICM B01J019-24
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 47
IT **Chlorination**
(of ethylene, reactor for)
IT **Chlorination**

(apparatus, for ethylene, sparger design in)
IT **Reactors**
(gas-liquid, tubular, sparger design in)
IT 1300-21-6P, Dichloroethane
RL: **PREP (Preparation)**
(manufacture of, **ethylene chlorination** reactor for)

L109 ANSWER 16 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1989:137478 HCAPLUS
DOCUMENT NUMBER: 110:137478
TITLE: Apparatus for **production** of **chlorinated paraffin** waxes by forced **circulation**
INVENTOR(S): Lin, Qunxiang
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 5 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 87106851	A	19880727	CN 1987-106851	19871006 <--
CN 1008085	B	19900523		

PRIORITY APPLN. INFO.: CN 1987-106851 19871006 <--
ED Entered STN: 15 Apr 1989
AB The title apparatus comprises a reactor, a recycle loop, and control valves. The reactor comprises a Cl inlet, a gas outlet, and an agitator; and the recycle loop comprises an acid-resistant pump, a jet pump, and a storage tank. The apparatus is illustrated.
IC ICM C07C019-02
ICS C07C017-00
CC 45-3 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 47
IT **Chlorination**
(apparatus, for paraffin waxes, with recycle loop)

L109 ANSWER 17 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1984:438089 HCAPLUS
DOCUMENT NUMBER: 101:38089
TITLE: Chlorination of paraffin in a film reactor
AUTHOR(S): Karag'ozov, Kh.; Prodanov, E.; Dinov, A.
CORPORATE SOURCE: Higher Sch. Chem.-Technol., Bulg.
SOURCE: Chemicky Prumysl (1984), 34(3), 141-3
CODEN: CHPUA4; ISSN: 0009-2789
DOCUMENT TYPE: Journal
LANGUAGE: Czech
ED Entered STN: 04 Aug 1984
AB Title reaction of n-C7H16 (I) at 40-60° and I-Cl ratio 0.25-0.50 gave monochloroheptanes with 89.7-93.0% selectively. The latter decreased with increasing temperature and I-Cl ratio.
CC 23-3 (Aliphatic Compounds)
IT **Chlorination**
(of paraffins in film reactor)
IT Alkyl chlorides
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(**preparation** of, by **chlorination** of **alkanes** in film reactor)

IT **Reactors**
(film, for monochlorination of alkanes)

L109 ANSWER 18 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1976:559289 HCAPLUS
DOCUMENT NUMBER: 85:159289
TITLE: Mathematical model of dichloroethane formation in rotary film apparatus
AUTHOR(S): Szepvolgyi, J.; Toros, R.; Ujhidy, A.
CORPORATE SOURCE: Res. Inst. Tech. Chem., Veszprem, Hung.
SOURCE: Int. Congr. Chem. Eng., Chem. Equip. Des. Autom., [Proc.], 5th (**1975**), Volume K, K4.7, 10 pp..
5th Congr. CHISA: Prague, Czech.
CODEN: 32SHAW
DOCUMENT TYPE: Conference
LANGUAGE: English
ED Entered STN: 12 May 1984
AB Math. models of dichloroethane formation from ethylene and Cl in ethylene dichloride solvent, based on film theory and penetration theory are described. Values of mass transfer coeffs. calculated from the models are compared with extpl. data.
CC 23-3 (Aliphatic Compounds)
Section cross-reference(s): 48
IT **Chlorination**
(of ethylene, math. model for)
IT **Reactors**
(rotary film, for chlorination of ethylene to dichloroethane)
IT 1300-21-6P
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(**preparation** of, by **chlorination** of **ethylene**, math. model for)
IT **7782-50-5, reactions**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(with ethylene, math. model for)

L109 ANSWER 19 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1975:500714 HCAPLUS
DOCUMENT NUMBER: 83:100714
TITLE: Continuous **production** of stable **chloro paraffins**
INVENTOR(S): Erlenbach, Lutz; Hermann, Rudolf; Conrad, Cuno
PATENT ASSIGNEE(S): Wintershall A.-G., Fed. Rep. Ger.
SOURCE: Can., 19 pp.
CODEN: CAXXA4
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
CA 953311	A1	19740820	CA 1971-113287		19710518 <--
PRIORITY APPLN. INFO.:			CA 1971-113287	A	19710518 <--

ED Entered STN: 12 May 1984
AB In the continuous chlorination of paraffins, chlorination was enhanced to 35-65% by reacting in successive reaction stages with temperature control by indirect cooling, and recycling a portion of the chloro paraffin to the preceding stage. The residual reaction gas containing 20-50% Cl and 50-80% HCl [7647-01-0] was conducted to an absorber which converted it to a gas containing 95% Cl. Thus, in a 3-stage chlorination reactor, the 1st stage was

charged with 400 kg/hr mixed paraffins, 560 kg/hr Cl was introduced in the 3rd stage, flowing countercurrent to the paraffins. The temperature was 90-100° and the pressure 0.3-0.5 atmospheric The gas absorber carried 2 m3/hr cold water to absorb 80% of the HCl produced in the 3rd stage. A portion of the prod., 660 kg/hr of 40% chlorinated paraffins, was further treated to remove gas. With intermediate absorption of HCl and recycling, the yield dropped 50%.

CC 51-11 (Fossil Fuels, Derivatives, and Related Products)

IT **Chlorination**
(continuous, of paraffin waxes)

IT **Reactors**
(for continuous chlorination of paraffin waxes)

IT 7647-01-0, uses and miscellaneous
RL: **REM (Removal or disposal)**; **PROC (Process)**
(removal of, in **chlorination** of **paraffin** waxes)

L109 ANSWER 20 OF 64 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1972:490511 HCAPLUS
DOCUMENT NUMBER: 77:90511
TITLE: Reactor for use with fluidized beds
INVENTOR(S): Vancamp, Raymond M.; Minor, Paul S.; Muren, Albert P., Jr.
PATENT ASSIGNEE(S): PPG Industries, Inc.
SOURCE: U.S., 9 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3679373	A	19720725	US 1968-783788	19681216 <--
PRIORITY APPLN. INFO.:			US 1968-783788	A 19681216 <--

ED Entered STN: 12 May 1984

AB In a fluidized-bed reactor (diameter ≥15 in.) for highly exothermic oxychlorination reactions, cooling surfaces are located near the point of O injection to reduce the corrosion of the cooling surfaces and the formation of large gas bubbles. Heat is withdrawn through the heat-transfer surfaces which contact catalyst particles in the central region 0-36 in. above O injection. The reactor was used for the oxychlorination of C2H4 to CH2ClCH2Cl by using O2-HCl over CuCl2-KCl catalyst particles.

IC C07C; B01J
INCL 023288000L

CC 47-2 (Apparatus and Plant Equipment)
Section cross-reference(s): 23

IT **Chlorination**
(apparatus for oxidative)

IT **Reactors**
(fluidized bed)

IT **107-06-2P**
RL: **PREP (Preparation)**
(manufacture of, apparatus for, by oxidative **chlorination** of **ethylene**)

=> d ibib ab hitind 21
YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' - CONTINUE? (Y)/N:y

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L109 ANSWER 21 OF 64 USPATFULL on STN DUPLICATE 1
ACCESSION NUMBER: 2004:335967 USPATFULL
TITLE: Method for the production of 1,2-dichloroethane
INVENTOR(S): Harth, Klaus, Altleiningen, GERMANY, FEDERAL REPUBLIC OF
Schindler, Gotz-Peter, Mannheim, GERMANY, FEDERAL REPUBLIC OF
Walsdorff, Christian, Ludwigshafen, GERMANY, FEDERAL REPUBLIC OF
Kuhrs, Christian, Heidelberg, GERMANY, FEDERAL REPUBLIC OF
Simon, Falk, Burstadt-Riedrode, GERMANY, FEDERAL REPUBLIC OF

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 2004267063	A1	20041230		
	US 6900363	B2	20050531		
APPLICATION INFO.:	US 2004-497598	A1	20040603	(10)	<--
	WO 2002-EP13729		20021204		<--

	NUMBER	DATE	
PRIORITY INFORMATION:	DE 2001-159615	20011205	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: KEIL & WEINKAUF, 1350 CONNECTICUT AVENUE, N.W., WASHINGTON, DC, 20036
NUMBER OF CLAIMS: 10
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 3 Drawing Page(s)
LINE COUNT: 984
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A process for preparing 1,2-dichloroethane which comprises

(A) feeding an ethane-containing feed gas stream into a dehydrogenation zone and dehydrogenating ethane to ethene to give a product gas stream comprising ethane, ethene and secondary constituents,

(B) feeding the ethane- and ethene-containing dehydrogenation product gas stream as a single stream or a plurality of substreams, optionally after having separated off secondary constituents, into one or more chlorination zones, chlorinating ethene to 1,2-dichloroethane to give one or more product gas streams comprising 1,2-dichloroethane, ethane and possibly further secondary constituents, isolating 1,2-dichloroethane and one or more ethane-containing circulating gas streams and recirculating the ethane-containing circulating gas stream or streams to the ethane dehydrogenation.

=> d ibib ab 22-37

YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' - CONTINUE? (Y)/N:y

L109 ANSWER 22 OF 64 USPATFULL on STN
ACCESSION NUMBER: 2005:172056 USPATFULL
TITLE: Process for the conversion of ethylene to vinyl chloride, and novel catalyst compositions useful for such process
INVENTOR(S): Jones, Mark E., Midland, MI, UNITED STATES
Hickman, Daniel A., Midland, MI, UNITED STATES
Olken, Michael M., Midland, MI, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005148805	A1	20050707
APPLICATION INFO.:	US 2005-53688	A1	20050208 (11)

RELATED APPLN. INFO.: Division of Ser. No. US 2002-130104, filed on 14 May 2002, PENDING A 371 of International Ser. No. WO 2000-US27272, filed on 3 Oct 2000

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-166897P	19991122 (60)

<--
DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: THE DOW CHEMICAL COMPANY, INTELLECTUAL PROPERTY SECTION, P. O. BOX 1967, MIDLAND, MI, 48641-1967, US
NUMBER OF CLAIMS: 15
EXEMPLARY CLAIM: 1
LINE COUNT: 1256
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB This invention is a process for producing vinyl chloride from an ethylene-containing feed, oxygen, and a chlorine source in the presence of a catalyst. The process permits direct production of vinyl chloride in a single reactor system, and further permits ethane to be used as the C.sub.2 hydrocarbon feed with recycle of ethylene from the product stream to constitute the ethylene specified for the feed. This invention in another aspect concerns also a composition of matter, and a method for making the composition, wherein the composition is useful as a catalyst for the vinyl chloride process. The composition comprises a rare earth-containing material, with the proviso that the catalyst prepared therefrom is substantially free of iron and copper and with the further proviso that when cerium is present the catalyst further comprises at least one more rare earth element other than cerium.

L109 ANSWER 23 OF 64 USPATFULL on STN
ACCESSION NUMBER: 2005:57526 USPATFULL
TITLE: Method of producing ethylene (di) chloride (EDC)
INVENTOR(S): Benje, Michael, Darmstadt, GERMANY, FEDERAL REPUBLIC OF
PATENT ASSIGNEE(S): Uhde GmbH (non-U.S. corporation)
Vinnolit Technologie GmbH & Co. KG (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005049444	A1	20050303
APPLICATION INFO.:	US 2004-961316	A1	20041008 (10)

RELATED APPLN. INFO.: Division of Ser. No. US 2001-936335, filed on 12 Sep

2001, GRANTED, Pat. No. US 6841708 A 371 of International Ser. No. WO 1999-EP7649, filed on 12 Oct 1999, UNKNOWN

	NUMBER	DATE	
PRIORITY INFORMATION:	DE 1999-19910964	19990312	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: WILLIAM COLLARD, COLLARD & ROE, P.C., 1077 NORTHERN BOULEVARD, ROSLYN, NY, 11576
NUMBER OF CLAIMS: 14
EXEMPLARY CLAIM: CLM-01-20
NUMBER OF DRAWINGS: 3 Drawing Page(s)
LINE COUNT: 396
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB With a method or a device for producing 1,2-dichloroethane or ethylene (di)chloride (EDC) with the use of a circulating reaction medium and a catalyst, whereby ethylene and chlorine are supplied to the reaction medium, the goal is to permit the catalytic chlorination of ethylene in a manner that is particularly gentle to the product.

This is achieved in terms of the method and by other means in that the ethylene or chlorine gas are introduced into the reaction medium by means of microporous gas diffuser elements for producing gas bubbles with a diameter of 0.3 to 3 mm.

L109 ANSWER 24 OF 64 USPATFULL on STN
ACCESSION NUMBER: 2005:154042 USPATFULL
TITLE: Process for the conversion of ethylene to vinyl chloride and novel catalyst compositions useful for such process
INVENTOR(S): Jones, Mark E., Midland, MI, UNITED STATES
Olken, Michael M., Midland, MI, UNITED STATES
Hickman, Daniel A., Midland, MI, UNITED STATES
PATENT ASSIGNEE(S): The Dow Chemical Company, Midland, MI, UNITED STATES (U.S. corporation)

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 6909024	B1	20050621		
	WO 2001038273		20010531		<--
APPLICATION INFO.:	US 2002-130104		20001003	(10)	<--
	WO 2000-US27272		20001003		<--
			20020514	PCT 371 date	

	NUMBER	DATE	
PRIORITY INFORMATION:	US 2002-166897P	19991122 (60)	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: GRANTED
PRIMARY EXAMINER: Price, Elvis O.
NUMBER OF CLAIMS: 26
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 0 Drawing Figure(s); 0 Drawing Page(s)
LINE COUNT: 1362
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB This invention is a process for producing vinyl chloride from an ethylene-containing feed, oxygen, and a chlorine source in the presence of a catalyst. The process permits direct production of vinyl chloride

in a single reactor system, and further permits ethane to be used as the C.sub.2 hydrocarbon feed with recycle of ethylene from the product stream to constitute the ethylene specified for the feed. This invention in another aspect concerns also a composition of matter, and a method for making the composition, wherein the composition is useful as a catalyst for the vinyl chloride process. The composition comprises a rare earth-containing material, with the proviso that the catalyst prepared therefrom is substantially free of iron and copper and with the further proviso that when cerium is present the catalyst further comprises at least one more rare earth element other than cerium.

L109 ANSWER 25 OF 64 USPATFULL on STN
ACCESSION NUMBER: 2005:6910 USPATFULL
TITLE: Method of producing ethylene (di)chloride (EDC)
INVENTOR(S): Benje, Michael, Darmstadt, GERMANY, FEDERAL REPUBLIC OF
PATENT ASSIGNEE(S): Vinnolit Technologie GmbH & Co., Burgkirchen, GERMANY, FEDERAL REPUBLIC OF (non-U.S. corporation)
Uhde GmbH, Dortmund, GERMANY, FEDERAL REPUBLIC OF (non-U.S. corporation)

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 6841708	B1	20050111		
	WO 2000055107		20000921		<--
APPLICATION INFO.:	US 2001-936335		20010912	(9)	<--
	WO 1999-EP7649		19991012		<--
			20010912	PCT 371 date	

	NUMBER	DATE	
PRIORITY INFORMATION:	DE 1999-19910964	19990312	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: GRANTED
PRIMARY EXAMINER: Richter, Johann
ASSISTANT EXAMINER: Price, Elvis O.
LEGAL REPRESENTATIVE: Collard & Roe, P.C.
NUMBER OF CLAIMS: 6
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 6 Drawing Figure(s); 3 Drawing Page(s)
LINE COUNT: 372
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB With a method or a device for producing 1,2-dichloroethane or ethylene (di)chloride (EDC) with the use of a circulating reaction medium and a catalyst, whereby ethylene and chlorine are supplied to the reaction medium, the goal is to permit the catalytic chlorination of ethylene in a manner that is particularly gentle to the product.

This is achieved in terms of the method and by other means in that the ethylene or chlorine gas are introduced into the reaction medium by means of microporous gas diffuser elements for producing gas bubbles with a diameter of 0.3 to 3 mm.

L109 ANSWER 26 OF 64 USPATFULL on STN
ACCESSION NUMBER: 2004:232916 USPATFULL
TITLE: Method of chlorine purification and process for producing 1,2-dichloroethane
INVENTOR(S): Oku, Noriaki, Ichihara-Shi, JAPAN
Seo, Tateo, Chiba-shi, JAPAN
Iwanaga, Kiyoshi, Chiba-shi, JAPAN

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 2004179987	A1	20040916		
APPLICATION INFO.:	US 2003-480279	A1	20031211	(10)	<--
	WO 2002-JP6172		20020620		<--

	NUMBER	DATE	
PRIORITY INFORMATION:	JP 2001-196168	20010628	<--
	JP 2001-196169	20010628	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: SUGHRUE MION, PLLC, 2100 PENNSYLVANIA AVENUE, N.W., SUITE 800, WASHINGTON, DC, 20037
NUMBER OF CLAIMS: 13
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 5 Drawing Page(s)
LINE COUNT: 462
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method for chlorine purification in which crude chlorine containing nitrogen and/or oxygen is purified to separate the nitrogen and oxygen from the chloride, characterized in that the crude chlorine containing nitrogen and/or oxygen is contacted with 1,2-dichloroethane to cause the 1,2-dichloroethane to absorb the chlorine contained in the crude chlorine, and a process for producing 1,2-dichloroethane which comprises reacting ethylene with the chlorine contained in the chlorine containing 1,2-dichloroethane.

L109 ANSWER 27 OF 64 USPATFULL on STN
ACCESSION NUMBER: 2004:77386 USPATFULL
TITLE: Method and device for utilizing heat in the production of 1,2-dichloroethane
INVENTOR(S): Motz, Joachim, Kelkeim, GERMANY, FEDERAL REPUBLIC OF

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 2004059166	A1	20040325	
APPLICATION INFO.:	US 2003-670970	A1	20030925	(10)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 2002-70842, filed on 22 May 2002, PENDING A 371 of International Ser. No. WO 2000-EP8963, filed on 14 Sep 2000, UNKNOWN			

	NUMBER	DATE	
PRIORITY INFORMATION:	DE 1999-19945355	19990922	<--
	DE 2000-10037323	20000729	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: Attn: Mark Hixon, Esq., Marshall & Melhorn, LLC, 8th Floor, Four SeaGate, Toledo, OH, 43604
NUMBER OF CLAIMS: 9
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 2 Drawing Page(s)
LINE COUNT: 282
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB In a process for the production of 1,2-dichloroethane from chlorine and ethene by direct chlorination, the heat developed in the direct chlorination reactor is recovered despite the low reaction temperature level.

The invention provides for a process in which the vapourous 1,2-dichloroethane from the direct chlorination reactor (3) is compressed and then fed to heat exchangers for heat recovery, the facility being characterised in that a turbo-compressor (4) is arranged downstream of the direct chlorination reactor (3) for said compression.

L109 ANSWER 28 OF 64 USPATFULL on STN

ACCESSION NUMBER:	2004:41494 USPATFULL				
TITLE:	Method and device for utilizing heat in the production of 1,2-dichloroethane				
INVENTOR(S):	Motz, Joachim, Kelkeim, GERMANY, FEDERAL REPUBLIC OF				
PATENT ASSIGNEE(S):	Uhde GmbH, Dortmund, GERMANY, FEDERAL REPUBLIC OF (non-U.S. corporation)				
	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 6693224	B1	20040217		
	WO 2001021564		20010329		<--
APPLICATION INFO.:	US 2002-70842		20020522	(10)	<--
	WO 2000-EP8963		20000914		<--
	NUMBER		DATE		
PRIORITY INFORMATION:	DE 1999-19945355		19990922		<--
	DE 2000-10037323		20000729		<--
DOCUMENT TYPE:	Utility				
FILE SEGMENT:	GRANTED				
PRIMARY EXAMINER:	Vollano, Jean F.				
LEGAL REPRESENTATIVE:	Marshall & Melhorn, LLC				
NUMBER OF CLAIMS:	3				
EXEMPLARY CLAIM:	1,2				
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)				
LINE COUNT:	254				

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention relates to a method for the production of 1,2-dichloroethane by direct chlorination using chlorine and ethene in which, despite low reaction temperatures during direct chlorination, reaction heat produced is nevertheless used. According to the invention, vaporous 1,2-dichloroethane obtained in the direct chlorination reactor is compressed and the compressed 1,2-dichloroethane is transported to heat exchangers whereby heat is given off by the 1,2-dichloroethane. The invention also relates to a device including a turbocompressor arranged directly after the direct chlorination reactor.

L109 ANSWER 29 OF 64 USPATFULL on STN

ACCESSION NUMBER:	2001:98144 USPATFULL				
TITLE:	Process and unit for the production of 1,2-dichloroethane				
INVENTOR(S):	Porscha, Peter, Kelkheim, Germany, Federal Republic of				
PATENT ASSIGNEE(S):	Krupp Uhde GmbH, Dortmund, Germany, Federal Republic of (non-U.S. corporation)				
	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 6252125	B1	20010626		<--
APPLICATION INFO.:	US 2000-549682		20000414	(9)	<--
	NUMBER		DATE		
PRIORITY INFORMATION:	DE 1999-19916753		19990414		<--

DOCUMENT TYPE: Utility
FILE SEGMENT: GRANTED
PRIMARY EXAMINER: Siegel, Alan
LEGAL REPRESENTATIVE: Roseman & Colin, LLP
NUMBER OF CLAIMS: 3
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 1 Drawing Figure(s); 1 Drawing Page(s)
LINE COUNT: 338
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB By a process for the production of 1,2-dichloroethane (EDC) by reaction of ethylene with chlorine in the liquid phase (direct chlorination), the heavy ends being separated from the obtained 1,2-dichloroethane in a heavy-ends column and in a downstream vacuum column and, for the purpose of heat recovery and heating of the column bottoms, a 1,2-dichloroethane part-stream from the direct chlorination passing through a heat exchanger (one attributed to each column) for indirect heat exchange with the bottom product of each column, the aim of the invention is to provide a solution in which the reaction enthalpy of the direct chlorination can be used in a variable manner, thus precluding the above-described disadvantages.

This is achieved by using at least one falling-film evaporator for heating the column bottoms, the bottom product of the respective column being routed to the distributor at the head of the column.

L109 ANSWER 30 OF 64 USPATFULL on STN
ACCESSION NUMBER: 2001:67870 USPATFULL
TITLE: Process for the production of 1, 2-dichloroethane
INVENTOR(S): Motz, Joachim, Kelkheim, Germany, Federal Republic of
PATENT ASSIGNEE(S): Krupp Uhde GmbH, Dortmund, Germany, Federal Republic of (non-U.S. corporation)

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 6229059	B1	20010508		<--
APPLICATION INFO.:	US 2000-498003		20000204	(9)	<--

	NUMBER	DATE	
PRIORITY INFORMATION:	DE 1999-19904836	19990206	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Siegel, Alan
LEGAL REPRESENTATIVE: Rosenman & Colin LLP
NUMBER OF CLAIMS: 3
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 1 Drawing Figure(s); 1 Drawing Page(s)
LINE COUNT: 197
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Using a process for the production of 1,2-dichloroethane by reacting ethylene and chlorine in the liquid phase in the presence of a catalyst, the 1,2-dichloroethane produced being drawn off in the gaseous phase, the high-boilers being separated from the 1,2-dichloroethane in a heavy-ends column and in a downstream vacuum column and the light-boilers and gases, such as ethylene and hydrogen, being separated in an EDC stripping column or in a light-ends column, a commercial-scale solution should be created to effectively remove the hydrogen chloride at the head of the stripping column or light-boiling column to avoid corrosion occurring there.

This is achieved in that the cleaned 1,2-dichloroethane leaving the heavy-ends column is cleaned in the EDC stripping column or in the light-ends column by separating the light-boilers and the gases. This is effected by using an alkaline substance to neutralize the vapors and/or the condensed vapors leaving the EDC stripping column or the light-ends column, the hydrogen chloride thus also being removed.

L109 ANSWER 31 OF 64 USPATFULL on STN
ACCESSION NUMBER: 1999:43073 USPATFULL
TITLE: Production of ethylene dichloride by direct chlorination and production of vinyl chloride monomer using chlorine recycle and apparatus
INVENTOR(S): Freire, Francisco Jose, Wilmington, DE, United States
Kaiser, Bruce Arthur, Wilmington, DE, United States
Mah, Dennie Turin, Wilmington, DE, United States
Felix, Vinci Martinez, Kennett Square, PA, United States
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 5891318		19990406		<--
APPLICATION INFO.:	US 1996-771497		19961223	(8)	<--

	NUMBER	DATE		
PRIORITY INFORMATION:	US 1995-9515P	19951228	(60)	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Valentine, Donald R.
NUMBER OF CLAIMS: 17
EXEMPLARY CLAIM: 9
NUMBER OF DRAWINGS: 5 Drawing Figure(s); 4 Drawing Page(s)
LINE COUNT: 1312
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A process and a system uses a direct chlorination reactor for producing ethylene dichloride by direct chlorination, without the need for an oxychlorination unit. This ethylene dichloride may be used to make vinyl chloride monomer. In the process for making ethylene dichloride, ethylene and chlorine are both supplied to a direct chlorination reactor. The ethylene reacts with the chlorine to form ethylene dichloride. Chlorine is supplied to the direct chlorination reactor from an electrochemical cell which converts anhydrous hydrogen chloride to dry chlorine gas. This chlorine gas is purified and liquefied to form liquid dry chlorine, and the liquid dry chlorine is recycled to the direct chlorination reactor. The ethylene dichloride may be pyrolyzed to produce vinyl chloride monomer and anhydrous hydrogen chloride.

L109 ANSWER 32 OF 64 USPATFULL on STN
ACCESSION NUMBER: 95:25142 USPATFULL
TITLE: Manufacture of perchloroethylene by chlorinating hydrocarbons and partially chlorinated hydrocarbons in the presence of hydrogen
INVENTOR(S): Petrosky, Jimmie T., Wichita, KS, United States
Hieger, Steven R., Wichita, KS, United States
Gannaway, Evert E., Clearwater, KS, United States
Cupit, Charles R., Wichita, KS, United States
PATENT ASSIGNEE(S): Vulcan Materials Company, Wichita, KS, United States (U.S. corporation)

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 5399797		19950321		<--
APPLICATION INFO.:	US 1994-199696		19940222	(8)	<--

RELATED APPLN. INFO.: Continuation of Ser. No. US 1993-16236, filed on 11 Feb 1993, now abandoned
DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Mars, Howard T.
LEGAL REPRESENTATIVE: Burns, Doane, Swecker & Mathis
NUMBER OF CLAIMS: 27
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 2 Drawing Figure(s); 2 Drawing Page(s)
LINE COUNT: 585
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Perchloroethylene and hydrogen chloride are made by noncatalytic thermal chlorination of hydrocarbons and/or their partially chlorinated derivatives by reacting them with chlorine in the presence of hydrogen and carbon tetrachloride as a reactive diluent, under conditions which maximize consumption of carbon tetrachloride and minimize the production of heavy ends, such as hexachlorobenzene and other tarry products.

L109 ANSWER 33 OF 64 USPATFULL on STN
ACCESSION NUMBER: 91:96578 USPATFULL
TITLE: Process for purifying unreacted 1,2-dichloroethane from a 1,2-dichloroethane pyrolysis process
INVENTOR(S): Schmidhammer, Ludwig, Haiming, Germany, Federal Republic of
Haselwarter, Klaus, Emmerting, Germany, Federal Republic of
Klaus, Hermann, Marktl, Germany, Federal Republic of
Mohr, Klaus-Peter, Burghausen, Germany, Federal Republic of
PATENT ASSIGNEE(S): Wacker-Chemie GmbH, Munich, Germany, Federal Republic of (non-U.S. corporation)

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 5068475		19911126		<--
APPLICATION INFO.:	US 1991-681186		19910405	(7)	<--

	NUMBER	DATE	
PRIORITY INFORMATION:	DE 1990-4012538	19900419	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Mars, Howard T.
ASSISTANT EXAMINER: Kestler, Kimberly J.
LEGAL REPRESENTATIVE: Burgess, Ryan & Wayne
NUMBER OF CLAIMS: 3
EXEMPLARY CLAIM: 1,2
LINE COUNT: 396
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The invention relates to a process for purifying unreacted 1,2-dichloroethane from a 1,2-dichloroethane pyrolysis process by chlorinating the benzene produced as a by-product and removing the chlorination products by distillation.

L109 ANSWER 34 OF 64 USPATFULL on STN

ACCESSION NUMBER: 88:47414 USPATFULL
TITLE: Recovery of ethylene, chlorine and HCl from vented waste gas from direct chlorination reactor
INVENTOR(S): Cowfer, Joseph A., Medina, OH, United States
PATENT ASSIGNEE(S): B.F. Goodrich Company, Akron, OH, United States (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 4760207		19880726	<--
APPLICATION INFO.:	US 1986-908744		19860918 (6)	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Evans, J. E.
NUMBER OF CLAIMS: 5
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 1 Drawing Figure(s); 1 Drawing Page(s)
LINE COUNT: 436
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB In a process for producing 1,2-dichloroethane or ethylene dichloride ("EDC") in a high temperature direct chlorination ("HTDC") reactor in which ethylene is reacted with wet chlorine having a water content more than 100 ppm but no more than 1% by wt of the chlorine, the water leaves the reactor with the EDC product draw-off, either in the vapor overhead (if the HTDC is a boiling reactor), or, as a liquid sidestream (if the HTDC is a non-boiling reactor). In a subsequent step, the EDC draw-off is distilled in a product distillation column in which the water leaves in the overhead which is condensed to remove condensables in a first stage, and vent a non-condensable vent streams. The vent stream is corrosive due to the presence of minor amounts of chlorine, HCl and water, along with oxygen which is injected into the HTDC to improve selectivity of the reaction. The vent gases from the first stage are further cooled to a temperature in the range from about -30° C. to about 0° C. to condense condensables and freeze water without plugging the liquid lines. Plugging is avoided provided the vent stream contains less than 1.5% by wt of water, based on the weight of the vent stream. The essentially moisture-free non-condensables remaining are relatively non-corrosive and may be recycled to an oxychlorination reactor, also for the production of EDC, without unduly sacrificing the vent compressor and other carbon steel equipment in the recycle line.

L109 ANSWER 35 OF 64 USPATFULL on STN
ACCESSION NUMBER: 85:61192 USPATFULL
TITLE: Process for scavenging free chlorine in an ethylene dichloride stream
INVENTOR(S): Schneider, Wolfgang, Broadview Heights, OH, United States
Lenczyk, John P., Akron, OH, United States
PATENT ASSIGNEE(S): The B. F. Goodrich Company, Akron, OH, United States (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 4547599		19851015	<--
APPLICATION INFO.:	US 1984-604565		19840427 (6)	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Warren, Charles F.
ASSISTANT EXAMINER: Boska, Joseph A.
LEGAL REPRESENTATIVE: Lobo, Alfred D., Csontos, Alan A.

NUMBER OF CLAIMS: 4
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 3 Drawing Figure(s); 1 Drawing Page(s)
LINE COUNT: 316
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A trace amount of free chlorine, present along with comparable amounts of ethylene, oxygen and water vapor in the ethylene dichloride (EDC) effluent from a direct chlorination reactor, may be effectively scavenged by exposing the effluent to ultraviolet ("u-v") light having a wavelength less than about 4000Å which is absorbed by the chlorine, but to which both ethylene and EDC are essentially transparent. In this process, contaminant chlorine in substantially pure (99..sup.+ %) EDC is catalytically activated and reacts with EDC to form an unwanted byproduct, namely 1,1,2-trichloroethane ("triane"). The process is effective in either the gaseous phase or the liquid phase.

L109 ANSWER 36 OF 64 USPATFULL on STN
ACCESSION NUMBER: 83:48206 USPATFULL
TITLE: Process for producing 1,2-dichloroethane
INVENTOR(S): Akiyama, Tsunekazu, Kurashiki, Japan
Kihara, Tetsuaki, Yokohama, Japan
Komizo, Kazunaga, Kurashiki, Japan
Kameo, Hiroshi, Kurashiki, Japan
PATENT ASSIGNEE(S): Ryo-nichi Company Ltd., Tokyo, Japan (non-U.S. corporation)

	NUMBER	KIND	DATE		
PATENT INFORMATION:	US 4410747		19831018		<--
	WO 8202197		19820708		<--
APPLICATION INFO.:	US 1981-276351		19810611	(6)	<--
	WO 1980-JP330		19801226		<--
			19810611	PCT 371 date	
			19810611	PCT 102(e) date	

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Warren, Charles F.
ASSISTANT EXAMINER: Boska, Joseph A.
LEGAL REPRESENTATIVE: Oblon, Fisher, Spivak, McClelland & Maier
NUMBER OF CLAIMS: 6
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 1 Drawing Figure(s); 1 Drawing Page(s)
LINE COUNT: 570
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB In the technology for producing 1,2-dichloroethane by reacting ethylene with chlorine by a liquid phase reaction at 65° to 160° C. in 1,2-dichloroethane containing a metal chloride catalyst, there is a disadvantage of a side reaction for producing 1,1,2-trichloroethane etc. at a large ratio to cause lower yield of 1,2-dichloroethane. The present invention is to overcome the disadvantage and to produce 1,2-dichloroethane in high yield by reducing the side reaction by incorporating at least one of aromatic compounds selected from the group consisting of benzene type hydrocarbons having the formula ##STR1## wherein R.sub.1, R.sub.2 and R.sub.3 respectively represent hydrogen atom, C.sub.1 -C.sub.5 alkyl group and chlorinated derivatives thereof as a side reaction inhibitor at a ratio of at least 0.001 weight % in the reaction medium.

L109 ANSWER 37 OF 64 USPATFULL on STN
ACCESSION NUMBER: 80:17397 USPATFULL

TITLE: Preparation of organic halides
INVENTOR(S): Davis, Ralph A., Midland, MI, United States
PATENT ASSIGNEE(S): The Dow Chemical Company, Midland, MI, United States (U.S. corporation)

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 4197262		19800408	<--
APPLICATION INFO.:	US 1978-957491		19781103 (5)	<--

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Demers, Arthur P.
LEGAL REPRESENTATIVE: Kuszaj, James M., Enright, Charles J.
NUMBER OF CLAIMS: 20
EXEMPLARY CLAIM: 1
LINE COUNT: 273
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Organic halides containing at least one halogen-replaceable bromine atom are reacted with chlorine in the presence of a catalyst selected from the group consisting of the halides of antimony, tin, zinc, or vanadium to form a corresponding organic halide having at least the one bromine atom replaced by a chlorine atom.

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YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' - CONTINUE? (Y)/N:y

L109 ANSWER 38 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 2003-599611 [57] WPIX
DOC. NO. CPI: C2003-162959
TITLE: Production of 1,2-dichloroethane for conversion into vinyl chloride involves dehydrogenation of ethane, chlorination of the resulting ethene in presence of unreacted ethane and recycling the ethane.
DERWENT CLASS: A41 E16
INVENTOR(S): HARTH, K; KUHRS, C; SCHINDLER, G; SIMON, F; WALSDORFF, C
PATENT ASSIGNEE(S): (BADI) BASF AG; (HART-I) HARTH K; (KUHR-I) KUHRS C; (SCHI-I) SCHINDLER G; (SIMO-I) SIMON F; (WALS-I) WALSDORFF C
COUNTRY COUNT: 103
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
DE 10159615	A1	20030612	(200357)*		13	C07C017-02<--
WO 2003048088	A1	20030612	(200357)	GE		C07C019-045<--
RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW						
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW						
AU 2002365634	A1	20030617	(200419)			C07C019-045<--
EP 1453778	A1	20040908	(200459)	GE		C07C019-045<--
R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR						

US 2004267063	A1	20041230	(200503)		C07C017-15
JP 2005511670	W	20050428	(200530)	24	C07C017-02<--
US 6900363	B2	20050531	(200536)		C07C017-15
CN 1599705	A	20050323	(200545)		C07C019-045<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
DE 10159615	A1	DE 2001-10159615	20011205	<--
WO 2003048088	A1	WO 2002-EP13729	20021204	<--
AU 2002365634	A1	AU 2002-365634	20021204	<--
EP 1453778	A1	EP 2002-804222	20021204	<--
		WO 2002-EP13729	20021204	<--
US 2004267063	A1	WO 2002-EP13729	20021204	<--
		US 2004-497598	20040603	
JP 2005511670	W	WO 2002-EP13729	20021204	<--
		JP 2003-549283	20021204	<--
US 6900363	B2	WO 2002-EP13729	20021204	<--
		US 2004-497598	20040603	
CN 1599705	A	CN 2002-824169	20021204	<--

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2002365634	A1 Based on	WO 2003048088
EP 1453778	A1 Based on	WO 2003048088
JP 2005511670	W Based on	WO 2003048088
US 6900363	B2 Based on	WO 2003048088

PRIORITY APPLN. INFO: **DE 2001-10159615 20011205**

INT. PATENT CLASSIF.:

MAIN: **C07C017-02**; C07C017-15; **C07C019-045**

SECONDARY: C07C017-152; C07C017-158; C07C017-25; C07C017-38; C07C021-06; C07C021-066

BASIC ABSTRACT:

DE 10159615 A UPAB: 20030906

NOVELTY - A method for the production of 1,2-dichloroethane (DCE) involves dehydrogenation of ethane-containing gas, chlorination of the resulting ethene in presence of unreacted ethane etc., working up to give DCE and returning unreacted ethane to the dehydrogenation stage.

DETAILED DESCRIPTION - A method for the production of 1,2-dichloroethane (DCE) involves (A) dehydrogenating ethane-containing gas to give a stream containing ethane, ethene and by-products, (B) feeding the product (in one or more part-streams and optionally after removing by-products) into one or more chlorination zones, chlorinating the ethene to give product stream(s) containing DCE, ethane and possibly other by-products, working up to give DCE and returning ethane-containing gas stream(s) to stage (A).

An INDEPENDENT CLAIM is also included for a method for the production of vinyl chloride by dehydrogenation of ethane as in stage (A) above, followed by (B1) oxychlorination of ethene to DCE, (B2) direct chlorination of ethene to DCE (with recycling of ethane as above) and (C) pyrolysis of the DCE from B1 and B2 to give a mixture of vinyl chloride, hydrogen chloride, DCE and possibly by-products, working up to give vinyl chloride and returning HCl to stage (B1).

USE - 1,2-Dichloroethane obtained by this method is used especially for the production of vinyl chloride.

ADVANTAGE - Enables the production of 1,2-dichloroethane and vinyl chloride from ethane, by extension of existing methods based on ethene. This results in lower costs for materials and equipment.

DESCRIPTION OF DRAWING(S) - Flow diagram for production of 1,2-dichloroethane (DCE).

Ethane-containing feed 1
Heat exchangers 2, 7
Dehydrogenation reactor 3
Air and/or hydrogen (optional co-feeds) 4, 4b
Ethene-containing product stream 5
Hydrogen chloride 6
Oxygen 6a
Chlorination reactor 8
Chlorination product 9
Condenser 10
Non-condensables (recycled) 11
Condensables 12
Phase separator 13
Aqueous and organic phases 14, 15
Distillation columns 16, 17
Low-boiling fraction 18
High-boiling fraction 19
Pure DCE 20

Dwg.1/3

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; GI; DCN
MANUAL CODES: CPI: A01-D12; E10-H03C3; **E10-H03C4**; N01-D01; N01-D03; N02-F02; N03-A; N03-G
TECH UPTX: 20030906

TECHNOLOGY FOCUS - CHEMICAL ENGINEERING - Preferred Method: Stage (A) involves thermal cleavage (cracking), oxidative dehydrogenation or non-oxidative catalytic dehydrogenation, preferably autothermic catalytic dehydrogenation. Chlorination (stage B) involves oxychlorination and/or direct chlorination, i.e. the overall process involves stage (A) as above followed by (B1) oxychlorination of one part-stream and (B2) direct chlorination of a second part-stream (performed in parallel with conversion of ethene into DCE and recycling of ethane to stage A in each case).

The second part-stream from (A) is worked up by removing water and then separating ethane and ethene from the other by-products in an absorption/desorption cycle with a high-boiling absorber; the ethane and ethene are then fed into the direct chlorination zone (B2).

The product from oxychlorination (B1) is processed to give a stream containing ethane and non-condensable components (ethene, methane, carbon oxides, nitrogen and hydrogen), which is returned to stage (A), optionally after further processing by absorption/desorption as above to give a **circulating** stream essentially comprising ethane.

Similar recycling streams may be obtained from B1 and B2, and processed by absorption/desorption as above.

Carbon dioxide is removed from these recycling streams in a CO2 scrubber, preferably after oxidation of carbon monoxide in a combustion stage.

L109 ANSWER 39 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 2002-107147 [15] WPIX
DOC. NO. CPI: C2002-033128
TITLE: Production of 1,2-dichloroethane by reacting ethylene and chlorine is carried out in liquid phase containing at least tetrahalogenated hydrocarbon, e.g. tetrachloroethane.

DERWENT CLASS: E16
INVENTOR(S): HAERTER, P; HERRMANN, W A; JACULI, D; MIELKE, I; STOEGER, M; TRAUTSCHOLD, S
PATENT ASSIGNEE(S): (VINN-N) VINNOLIT TECHNOLOGIE GMBH & CO KG
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
DE 10030681	A1	20020110	(200215)*		4	C07C017-02<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
DE 10030681	A1	DE 2000-10030681	20000623 <--

PRIORITY APPLN. INFO: **DE 2000-10030681**
20000623
INT. PATENT CLASSIF.:
MAIN: **C07C017-02**
SECONDARY: **C07C019-045**
BASIC ABSTRACT:

DE 10030681 A UPAB: 20020306
NOVELTY - In the production of 1,2-dichloroethane (I) by reacting ethylene (C2H4) and chlorine (Cl2) in a **circulating** liquid phase, the liquid phase is a mixture with an at least tetrahalogenated hydrocarbon (II).

USE - None given.

ADVANTAGE - The liquid phase in this reaction normally consists mainly of (I) or a mixture of chlorohydrocarbons. Using more a highly halogenated hydrocarbon (II) as reaction medium greatly increases the selectivity and reaction rate.

DESCRIPTION OF DRAWING(S) - The drawing shows the kinematics of the uncatalysed reaction in 1,1,2,2-tetrachloroethane (continuous line) compared with that in 1,2-dichloroethane (dotted line). (Drawing includes non-English language text).

Dwg.1/2

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; GI; DCN
MANUAL CODES: CPI: **E10-H03C4**; E11-F08; N01-A; N01-B; N02-A; N04-D01; N07-D09
TECH UPTX: 20020306

TECHNOLOGY FOCUS - CHEMICAL ENGINEERING - Preferred Process: Reaction is carried out at such a pressure and temperature that the reaction mixture boils in the reactor.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Process: An alkali(ne earth) halide and iron-III chloride (FeCl3) are used as catalyst, preferably sodium chloride (NaCl) and FeCl3 in a molar ratio less than 0.5.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Additive: The hydrocarbon (II) is halogenated with chlorine (Cl) and/or fluorine (F). It is saturated or unsaturated, contains 2 or more carbon (C) atoms and has a boiling point of over 100 degreesC.
(II) preferably is derived from ethane and especially is 1,1,2,2- or 1,1,1,2-tetrachloroethane, pentachloroethane, hexachloroethane and/or tetrachloroethene.

ABEX UPTX: 20020306
EXAMPLE - Measurements with stopped flow apparatus were made at 25 degreesC to determine the rate of reaction. Tests were carried out without catalyst at concentrations of 27 mmole chlorine/l and 35 mmole ethylene/l. The rate constant of conversion was 1.9 l/mole-second in 1,2-dichloroethane; and 13.7 l/mole-second in 1,1,2,2-tetrachloroethane (IIA), i.e. reaction was 7 times faster in (II).

L109 ANSWER 40 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 2002-270250 [32] WPIX
DOC. NO. CPI: C2002-080295
TITLE: Process for dichloroethane by direct chlorination.
DERWENT CLASS: E16
INVENTOR(S): HU, M; SHENG, X; YUAN, X
PATENT ASSIGNEE(S): (SHAN-N) SHANGHAI LUJIAN CHEM CO LTD
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
CN 1333199	A	20020130	(200232)*			C07C019-045<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
CN 1333199	A	CN 2001-126420	20010807	<--

PRIORITY APPLN. INFO: **CN 2001-126420**
20010807
INT. PATENT CLASSIF.:
MAIN: **C07C019-045**
SECONDARY: **C07C017-02**
BASIC ABSTRACT:
CN 1333199 A UPAB: 20020521
NOVELTY - The present invention provides a method for preparing ethylidene chloride by means of direct chlorination and its equipment. It is characterized by that the raw material chlorine gas, raw material ethylene and **circulating** ethylidene chloride are respectively fed into pipe reactor with internal member from respective inlet, the chlorine gas can be separated into small bubbles by internal member anddissolved in be separated into small bubbles by internal member and dissolved in ethylidene chloride, then the ethylene is separated into the bubbles by internal member and directly chlorinated withethylidene chloride containing chlorine gas according to the ideal molar matching ratio of ethylene and chlorine gas in reaction zone so as to obtain the invented product. Said invented equipment includes a static mixing internal member with SKX and SV form and pipe reactor conlaining said internal member. It can obviously raise selectivity of reaction and reaction rate, and can reduce volume of reactor.
Dwg.0/0
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB
MANUAL CODES: CPI: **E10-H03C4**

L109 ANSWER 41 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 2001-464869 [50] WPIX
DOC. NO. CPI: C2001-140287
TITLE: Using heat of reaction from production of

1,2-dichloroethane from ethene and chlorine involves heating two fractionating columns with the latent heat from product vapor and sensible heat from liquid product.

DERWENT CLASS: A41 E16
INVENTOR(S): BENJE, M; PORSCHA, P; VON EGELSTEIN, S
PATENT ASSIGNEE(S): (KRPP) KRUPP UHDE GMBH; (UHDE) UHDE GMBH
COUNTRY COUNT: 95
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
WO 2001034542	A2	20010517	(200150)*	GE	19	C07C017-02<--
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW						
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW						
DE 19953762	A1	20010523	(200150)			C07C017-04<--
AU 2001012767	A	20010606	(200152)			C07C017-02<--
NO 2002002182	A	20020507	(200253)			C07C017-02<--
EP 1228022	A2	20020807	(200259)	GE		C07C017-02<--
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI						
JP 2003513943	W	20030415	(200328)		22	C07C017-02<--
DE 19953762	C2	20030710	(200347)			C07C017-04
EP 1228022	B1	20040609	(200438)	GE		C07C017-02<--
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE						
DE 50006765	G	20040715	(200446)			C07C017-02<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
WO 2001034542	A2	WO 2000-EP10630	20001028	<--
DE 19953762	A1	DE 1999-1053762	19991109	<--
AU 2001012767	A	AU 2001-12767	20001028	<--
NO 2002002182	A	WO 2000-EP10630	20001028	<--
		NO 2002-2182	20020507	<--
EP 1228022	A2	EP 2000-974475	20001028	<--
		WO 2000-EP10630	20001028	<--
JP 2003513943	W	WO 2000-EP10630	20001028	<--
		JP 2001-536493	20001028	<--
DE 19953762	C2	DE 1999-1053762	19991109	<--
EP 1228022	B1	EP 2000-974475	20001028	<--
		WO 2000-EP10630	20001028	<--
DE 50006765	G	DE 2000-00006765	20001028	<--
		EP 2000-974475	20001028	<--
		WO 2000-EP10630	20001028	<--

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 2001012767	A	Based on	WO 2001034542
EP 1228022	A2	Based on	WO 2001034542
JP 2003513943	W	Based on	WO 2001034542
EP 1228022	B1	Based on	WO 2001034542
DE 50006765	G	Based on	EP 1228022
		Based on	WO 2001034542

PRIORITY APPLN. INFO: **DE 1999-19953762**
19991109
INT. PATENT CLASSIF.:
MAIN: **C07C017-02**; C07C017-04
SECONDARY: C07C017-383; C07C017-389; **C07C019-045**
BASIC ABSTRACT:
WO 200134542 A UPAB: 20040316
NOVELTY - A method for using the heat of reaction from the production of 1,2-dichloroethane (ECD) from ethene and chlorine involves extracting this heat from the reaction zone by means of:
(a) ECD vapor (latent heat), and
(b) liquid ECD (sensible heat) and using it to heat two fractionating columns for removing higher-boiling impurities.
DETAILED DESCRIPTION - A INDEPENDENT CLAIM is also included for an installation for using the heat of reaction from the production of ECD, comprising a high-boiler column (5) and a downstream vacuum column (9) with associated falling film evaporators (16 and 14 respectively), evaporator (16) being heated with ECD vapor from the direct chlorination reactor (13) and evaporator (14) being heated with liquid ECD from (13).
USE - In the production of 1,2-dichloroethane by direct chlorination of ethylene.
ADVANTAGE - Enables the optimum use of the heat of reaction from the production of 1,2-dichloroethane within the scope of the balanced vinyl chloride monomer process.
DESCRIPTION OF DRAWING(S) - Production of 1,2-dichloroethane (EDC) from ethylene.
Crude EDC 1
Low-boilers column 2
High-boilers column 5
Vacuum column 9
Direct chlorination reactor 13
Falling film evaporators 14, 16
Vapor line 15
Reaction section 17
Stripper 18
Downpipe 19
Riser 20
Ethylene inlet 21
Trimming condenser 23
Receiver 25
Off-gas outlet 26
EDC part-streams 28, 29, 30, 31, 35, 36
Jet 32
EDC streams 34, 37, 38, 42
EDC cooler 39
Injector 40
Chlorine inlet 41
Dwg.1/1
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; GI; DCN
MANUAL CODES: CPI: A01-D12; **E10-H03C4**
TECH UPTX: 20010905
TECHNOLOGY FOCUS - CHEMICAL ENGINEERING - Preferred Method: Both fractionating columns are heated by falling film evaporators. The heat is used for preconcentration and post-concentration of the bottom products from the columns, consisting of impurities with boiling points higher than that of ECD. At least one ECD part-stream condensed after using the latent heat is recycled and used to assist the flow in the reactor, and a ECD part-stream cooled after using the latent or sensible heat is further

cooled and used to dissolve chlorine to give a solution which is then fed into the reactor.
Preferred Equipment: The system also includes:
(a) ECD part-stream line(s) (36, 31) in combination with a line (29) connected to an injector (40) for chlorine gas (line 41) and a feed line (42) for introducing chlorine-containing ECD into a reaction section (17) of reactor (13), and
(b) a part-stream line (38) for feeding cooled ECD streams from lines (35, 30) from the evaporators (14, 16) through a jet (32) into the downpipe (19) of the reactor (13) so as to speed up the **circulation.**

ABEX UPTX: 20010905
EXAMPLE - Direct chlorination of ethylene (4765 kg/hour) with the equivalent amount of chlorine was carried out in a loop reactor with a stripper section operated at 110 degreesC and 2.1 bar. The vapor component of the resulting dichloroethane (EDC) was transferred from the stripper at 70465 kg/h to a falling film evaporator with an output of 5094 kW to the attached high-boiler column which was operated with a bottom temperature of 100 degreesC. Residual EDC was condensed in a water-cooled trimming condenser with a thermal output of 951 kW, collected (at 102 degreesC) in a receiver and separated into EDC-loaded off-gas (2848 kg/h), an EDC part-stream for further processing (14017 kg/h) and an EDC part-stream (53600 kg/h) which was recycled to the downpipe of the reactor. EDC was also pumped from the reactor stripper at 250000 kg/h and transferred to another falling film evaporator with a thermal output of 1814 kW to the attached vacuum column (bottom temperature 87 degreesC. The cooled EDC (92 degreesC) from this evaporator was divided so that 40% was also recycled into the reactor downpipe and 60% (150000 kg/h) was cooled to 45 degreesC and passed through an injector, thereby sucking in chlorine at 12100 kg/h; the resulting solution of chlorine in EDC (75 degreesC) was fed into the riser side of the reactor.

L109 ANSWER 42 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 2001-255549 [26] WPIX
DOC. NO. CPI: C2001-076846
TITLE: Preparation of 1,2-dichloroethane.
DERWENT CLASS: E16
INVENTOR(S): BALCHUGOV, A V; KHARITONOV, V I; KUZNETSOV, A M; MEDVEDEV YU, I; MUBARAKOV, R G; SAMSONOV, V V; SHISHKIN, Z A; MEDVEDEV, J I
PATENT ASSIGNEE(S): (INIS-R) INIS CO LTD
COUNTRY COUNT: 30
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
RU 2162834	C1	20010210	(200126)*			C07C017-02<--
WO 2001068574	A1	20010920	(200156)	RU		C07C019-045<--

RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
W: AT BR CA CN ES GB ID IN JP KR SG TR UA US

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
RU 2162834	C1	RU 2000-106105	20000315	<--
WO 2001068574	A1	WO 2000-RU506	20001208	<--

PRIORITY APPLN. INFO: **RU 2000-106105**
20000315

INT. PATENT CLASSIF.:
MAIN: **C07C017-02; C07C019-045**
SECONDARY: **C07C019-045**
BASIC ABSTRACT:
RU 2162834 C UPAB: 20010515
NOVELTY - Described is production of dichloroethane by direct chlorination of ethylene in liquid dichloroethane.
DETAILED DESCRIPTION - 1,2-dichloroethane is prepared in vertical two-column reactor with gas-lifting **circulation** of dichloroethane in vertical circuit into which chlorine and ethylene are added. At reaction zone exit, local hydraulic assistance is built up by means of try to ascending flow of dichloroethane in first column, and pressure of ascending current is reduced to value close to pressure of dichloroethane vapors as they are withdrawn from reactor. In boiling zone located above reaction zone, vapor drip mode f low ascending current of dichloroethane is initiated. Dichloroethane is not allowed to boil in reaction zone by maintaining pressure therein built up by liquid dichloroethane column in second column and also by treating corresponding hydrolytic resistance. Vapor content of vapor-liquid mixture in boiling zone in vapor-drop mode of flow thereof is as high as 0.8-0.95. Motive force of **circulation** of liquid chloroethane becomes significantly higher in vertical circuit.
USE - Chemical industry.
ADVANTAGE - Intense heat taken off from reaction zone, increased efficiency and high-grade final product.
Dwg.0/0
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB
MANUAL CODES: CPI: **E10-H03C4**

L109 ANSWER 43 OF 64 - WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 2000-612503 [59] WPIX
DOC. NO. CPI: C2000-183438
TITLE: Catalytic production of 1,2-dichloromethane from ethylene and chlorine in **circulating** medium has ethylene feed in up-flow zone, mixer before chlorine feed in down-flow zone and evaporator using heat of reaction.
DERWENT CLASS: E16
INVENTOR(S): BENJE, M
PATENT ASSIGNEE(S): (KRPP) KRUPP UHDE GMBH; (UHDE) UHDE GMBH; (VINN-N) VINNOLIT TECHNOLOGIE GMBH & CO KG
COUNTRY COUNT: 87
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
DE 19910964	A1	20000921	(200059)*		7	C07C017-02<--
WO 2000055107	A1	20000921	(200059)	GE		C07C017-02<--
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW						
W: AL AM AU AZ BA BB BG BR BY CA CN CU CZ EE GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LV MD MG MK MN MW MX NO NZ PL RO RU SD SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW						
AU 9964705	A	20001004	(200101)			C07C017-02<--
NO 2001004198	A	20010829	(200171)			C07C000-00<--
EP 1161406	A1	20011212	(200204)	GE		C07C017-02<--
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI						
JP 2002539179	W	20021119	(200281)		23	C07C017-10<--
EP 1161406	B1	20040421	(200428)	GE		C07C017-02<--

R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DE 59909268	G 20040527 (200436)	C07C017-02<--	
ES 2217824	T3 20041101 (200474)	C07C017-02<-- .	
US 6841708	B1 20050111 (200505)	C07C017-02<--	
US 2005049444	A1 20050303 (200517)	C07C017-093	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
DE 19910964	A1	DE 1999-1010964	19990312	<--
WO 2000055107	A1	WO 1999-EP7649	19991012	<--
AU 9964705	A	AU 1999-64705	19991012	<--
NO 2001004198	A	WO 1999-EP7649	19991012	<--
		NO 2001-4198	20010829	<--
EP 1161406	A1	EP 1999-952553	19991012	<--
		WO 1999-EP7649	19991012	<--
JP 2002539179	W	WO 1999-EP7649	19991012	<--
		JP 2000-605538	19991012	<--
EP 1161406	B1	EP 1999-952553	19991012	<--
		WO 1999-EP7649	19991012	<--
DE 59909268	G	DE 1999-509268	19991012	<--
		EP 1999-952553	19991012	<--
		WO 1999-EP7649	19991012	<--
ES 2217824	T3	EP 1999-952553	19991012	<--
US 6841708	B1	WO 1999-EP7649	19991012	<--
		US 2001-936335	20010912	<--
US 2005049444	A1 Div ex	WO 1999-EP7649	19991012	<--
	Div ex	US 2001-936335	20010912	<--
		US 2004-961316	20041008	

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 9964705	A	Based on	WO 2000055107
EP 1161406	A1	Based on	WO 2000055107
JP 2002539179	W	Based on	WO 2000055107
EP 1161406	B1	Based on	WO 2000055107
DE 59909268	G	Based on	EP 1161406
		Based on	WO 2000055107
ES 2217824	T3	Based on	EP 1161406
US 6841708	B1	Based on	WO 2000055107
US 2005049444	A1	Div ex	US 6841708

PRIORITY APPLN. INFO: **DE 1999-19910964**
19990312

INT. PATENT CLASSIF.:

MAIN: C07C000-00; **C07C017-02**; C07C017-093; C07C017-10
SECONDARY: B01J010-00; C07C017-06; C07C017-38; **C07C019-045** ; C07C021-08
ADDITIONAL: C07B061-00

BASIC ABSTRACT:

DE 19910964 A UPAB: 20031223

NOVELTY - 1,2-dichloromethane is produced from ethylene and chlorine in **circulating** medium having ethylene feed in up-flow zone, mixer before chlorine feed in down-flow zone and evaporator using heat of reaction.

DETAILED DESCRIPTION - In the production of 1,2-dichloroethane (EDC) by passing ethylene (C2H4) and chlorine (Cl2) into a **circulating**

reaction medium and catalyst, C2H4 is introduced at a point where the medium flows up and Cl2 at a point where it flows down after passing through a mixing and dissolving zone. EDC vaporized by the heat of reaction is discharged as vapor, whilst the residue in the evaporator is recycled to the reaction zone. An INDEPENDENT CLAIM is also included for the plant used in this process.

USE - For producing 1,2-dichloromethane.

ADVANTAGE - An existing system for mass production of EDC uses a very large **circulating** stream and required large, high-power pumps, which makes the capital and operating costs high. Another uses the gas-lift effect of the gaseous reactants or natural convection for **circulation** but usually requires a Cl2 precompressor. Both systems can result in a local excess of Cl2 and the formation of more highly chlorinated by-products. The present process uses the heat of reaction and minimizes the formation of more highly chlorinated products, e.g. tri-, tetra- and penta-chloroethane and plant based on a modular, cost-effective system.

DESCRIPTION OF DRAWING(S) - The drawing shows a simplified version of the plant.

Plant 1
Evaporator 2
Vapor dome 3
Fall pipe 4
Transfer pipe 5, 5a
Riser 6, 6a
Divider in evaporator for modular construction 7
Flow direction 8
Flow straighteners 9, 13
Microporous gas distributors 10
Ethylene feed pipe 11
Dissolution zone 12
Feed for chlorine dissolved in reaction medium 14
Feed pipe for mixture of reaction medium and chlorine 15
By-pass pipe 16
Pump 17
Heat exchanger 18
Compressor 19
Pipes 20, 24
Static mixer 21
Throttle valve 22
Ultrasonic flow meter 23
Distributor 25
Dwg.1/2

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; GI; DCN
MANUAL CODES: CPI: **E10-H03C4**; N06
TECH UPTX: 20001117

TECHNOLOGY FOCUS - CHEMICAL ENGINEERING - Preferred Process: The reaction medium consists mainly of EDC. The mixing and reaction zone is kept at 75-200 degreesC and 1-15 bar and the flow velocity is regulated so that the residence time of the mixture in this zone is 1-30 seconds. C2H4 is introduced through a microporous gas distributor giving bubbles with a diameter of 0.3-3 mm. Cl2 is dissolved in a cooled side stream of the medium at the end of the mixing and dissolution zone and then passed into the main stream; or Cl2 is dissolved in the liquid separately and added to the reaction medium. Plant: The plant comprises an evaporation vessel, fall pipe and riser. In the flow direction, the riser has an C2H4 feed, then dissolution zone and finally a distributor pipe for introducing Cl2 dissolved in by-pass stream of the medium into the main stream of the medium. Preferred Plant: Forced **circulation** in the flow

direction of the reaction medium is produced by a **circulator** and controlled by a throttle valve or the like. There is also an ultrasonic meter to measure the flow of the main stream and a valve regulator. The plant has not less than 2 risers per fall pipe and especially one or more evaporators with fall pipe(s) and riser(s), giving one or more reaction zones in the **circulation**(s). Each unit is a module comprising an evaporation vessel, fall pipe and riser with inserts and devices for coupling to adjacent module(s). A microporous gas distributor is used for introducing C2H4 into the main stream and is preceded by a flow straightener to equalize the velocity profile and suppress radial velocity components in the main stream. The reaction zone also has flow straightening inserts, baffles or the like. The by-pass for the reaction medium has a pump, heat exchanger for cooling the side stream, compressor for suction and introduction of a gaseous or liquid Cl2 and/or static mixer and a pipe leading to a ring with distributor pipes for introducing the by-pass stream into the main stream. The mixer and heat exchanger preferably form one unit.

L109 ANSWER 44 OF 64 WPIX ©COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 1998-064405 [07] WPIX
DOC. NO. CPI: C1998-022498
TITLE: 1,2-Di chloroethane production at relatively low temperature - by reacting ethylene and chlorine in **circulating** di chloroethane, taking heat of reaction from gas space to heat exchanger.
DERWENT CLASS: E16
INVENTOR(S): GRUMANN, H; MIELKE, I; SCHWARZMAIER, P
PATENT ASSIGNEE(S): (FARH) HOECHST AG; (VINN-N) VINNOLIT MONOMER GMBH & CO KG
COUNTRY COUNT: 80
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
DE 19641562	A1	19980108	(199807)*		7	C07C019-045<--
WO 9801407	A1	19980115	(199809)	GE	18	C07C017-02<--
RW: AT BE CH DE DK EA ES FI FR GB GH GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW						
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU						
ZA 9705935	A	19980225	(199813)		14	C07C000-00<--
AU 9733452	A	19980202	(199826)			C07C017-02<--
NO 9806203	A	19981230	(199915)			C07C017-02<--
CZ 9900010	A3	19990317	(199917)			C07C017-02<--
EP 907626	A1	19990414	(199919)	GE		C07C017-02<--
R: BE DE ES FI FR GB GR IT NL SE						
SK 9801817	A3	19990611	(199930)			C07C017-02<--
CN 1224409	A	19990728	(199948)			C07C017-02<--
EP 907626	B1	20000126	(200010)	GE		C07C017-02<--
R: BE DE ES FI FR GB GR IT NL SE						
HU 9903027	A2	20000128	(200015)			C07C017-02<--
JP 2000500778	W	20000125	(200016)		15	C07C017-02<--
DE 59701072	G	20000302	(200018)			C07C017-02<--
BR 9710861	A	20000111	(200020)			C07C017-02<--
ES 2144318	T3	20000601	(200033)			C07C017-02<--
MX 9900123	A1	19990401	(200055)			C07C017-02<--
KR 2000022460	A	20000425	(200105)			C07C017-02<--
RU 2159759	C2	20001127	(200109)			C07C017-02<--
US 6235953	B1	20010522	(200130)			C07C017-02<--
NO 310682	B1	20010813	(200149)			C07C017-02<--

JP 3210022	B2	20010917 (200156)		6	C07C017-02<--
TW 442449	A	20010623 (200206)			C07C017-02<--
MX 203762	B	20010815 (200238)			C07C017-02<--
CZ 290462	B6	20020717 (200260)			C07C017-02<--
HU 221229	B1	20020828 (200264)			C07C017-02<--
CA 2259313	C	20021029 (200280)	EN		C07C019-045<--
SK 282662	B6	20021106 (200281)			C07C017-02<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
DE 19641562	A1	DE 1996-1041562	19961009	<--
WO 9801407	A1	WO 1997-EP3399	19970630	<--
ZA 9705935	A	ZA 1997-5935	19970703	<--
AU 9733452	A	AU 1997-33452	19970630	<--
NO 9806203	A	WO 1997-EP3399	19970630	<--
		NO 1998-6203	19981230	<--
CZ 9900010	A3	WO 1997-EP3399	19970630	<--
		CZ 1999-10	19970630	<--
EP 907626	A1	EP 1997-929308	19970630	<--
		WO 1997-EP3399	19970630	<--
SK 9801817	A3	WO 1997-EP3399	19970630	<--
		SK 1998-1817	19970630	<--
CN 1224409	A	CN 1997-196148	19970630	<--
EP 907626	B1	EP 1997-929308	19970630	<--
		WO 1997-EP3399	19970630	<--
HU 9903027	A2	WO 1997-EP3399	19970630	<--
		HU 1999-3027	19970630	<--
JP 2000500778	W	WO 1997-EP3399	19970630	<--
		JP 1998-504721	19970630	<--
DE 59701072	G	DE 1997-501072	19970630	<--
		EP 1997-929308	19970630	<--
		WO 1997-EP3399	19970630	<--
BR 9710861	A	BR 1997-10861	19970630	<--
		WO 1997-EP3399	19970630	<--
ES 2144318	T3	EP 1997-929308	19970630	<--
MX 9900123	A1	MX 1999-123	19990104	<--
KR 2000022460	A	WO 1997-EP3399	19970630	<--
		KR 1998-710897	19981231	<--
RU 2159759	C2	WO 1997-EP3399	19970630	<--
		RU 1999-101837	19970630	<--
US 6235953	B1	WO 1997-EP3399	19970630	<--
		US 1999-214181	19990823	<--
NO 310682	B1	WO 1997-EP3399	19970630	<--
		NO 1998-6203	19981230	<--
JP 3210022	B2	WO 1997-EP3399	19970630	<--
		JP 1998-504721	19970630	<--
TW 442449	A	TW 1997-107202	19970526	<--
MX 203762	B	MX 1999-123	19990104	<--
CZ 290462	B6	WO 1997-EP3399	19970630	<--
		CZ 1999-10	19970630	<--
HU 221229	B1	WO 1997-EP3399	19970630	<--
		HU 1999-3027	19970630	<--
CA 2259313	C	CA 1997-2259313	19970630	<--
		WO 1997-EP3399	19970630	<--
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		SK 1998-1817	19970630	<--

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 9733452	A	Based on	WO 9801407
CZ 9900010	A3	Based on	WO 9801407
EP 907626	A1	Based on	WO 9801407
EP 907626	B1	Based on	WO 9801407
HU 9903027	A2	Based on	WO 9801407
JP 2000500778	W	Based on	WO 9801407
DE 59701072	G	Based on	EP 907626
		Based on	WO 9801407
BR 9710861	A	Based on	WO 9801407
ES 2144318	T3	Based on	EP 907626
KR 2000022460	A	Based on	WO 9801407
RU 2159759	C2	Based on	WO 9801407
US 6235953	B1	Based on	WO 9801407
NO 310682	B1	Previous Publ.	NO 9806203
JP 3210022	B2	Previous Publ.	JP 200000778
		Based on	WO 9801407
CZ 290462	B6	Previous Publ.	CZ 9900010
		Based on	WO 9801407
HU 221229	B1	Based on	WO 9801407
CA 2259313	C	Based on	WO 9801407
SK 282662	B6	Previous Publ.	SK 9801817
		Based on	WO 9801407

PRIORITY APPLN. INFO: **DE 1996-19626827**
19960704
INT. PATENT CLASSIF.:
MAIN: C07C000-00; **C07C017-02**; **C07C019-045**
SECONDARY: B01J012-00; F28D021-00
ADDITIONAL: C07B061-00
BASIC ABSTRACT:
DE 19641562 A UPAB: 19980216
Production of 1,2-dichloroethane (EDC) involves feeding ethylene and chlorine into **circulating** EDC with intensive mixing and heat recovery. The reaction is carried out at 65-125 deg. C and 0.5-3.2 bar, the pressure and temperature being adjusted so that the reaction mixture boils, and the heat of reaction is removed from the gas space and transferred to heat exchanger(s). Also claimed is an apparatus for this process.
ADVANTAGE - The reaction is safe and well controlled at all times. Reaction temperatures can be kept low to minimise the formation of by-products. Using the heat of reaction and condensation enables small heat exchangers to be used; eliminates clogging with catalyst residues and high-boiling by-products; and makes it possible to design a more efficient, space-saving installation with heat exchangers close to the reactor and with short pipe runs.
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: **E10-H03C4**

L109 ANSWER 45 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 1997-447025 [41] WPIX
DOC. NO. CPI: C1997-142468
TITLE: 1,2-di chloro-ethane preparation by chlorination of ethylene - in a closed loop in liquid di chloro-ethane, the minimum **circulation** quantity of which is determined by formula.
DERWENT CLASS: E16

INVENTOR(S): KHARITONOV, V I; SAMSONOV, V V; SHISHKIN, Z A
PATENT ASSIGNEE(S): (IRCH-R) IRKUT CHEM EQUIP RES CONSTR INST; (SAYA-R) SAYANSKKHIMPROM STOCK CO
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
RU 2074849	C1	19970310	(199741)*		9	C07C019-045<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
RU 2074849	C1	RU 1994-37168	19940930 <--

PRIORITY APPLN. INFO: **RU 1994-37168 19940930**
INT. PATENT CLASSIF.:
MAIN: **C07C019-045**
SECONDARY: **C07C017-02**
BASIC ABSTRACT:
RU 2074849 C UPAB: 19971013
Ethylene is directly chlorinated to 1,2-dichloroethane in a closed loop reactor in liquid dichloroethane, the **circulating** quantity of which in the reaction zone is governed by the equation Gd.min > (GCl multiply qp) / (Cd [tbpd(P5) - tbpd(P8)]), where Gd.min = the minimum value of the expenditure of dichloroethane **circulating** in the reaction zone; GCl = the chlorine loading; qp = the thermal effect of the chlorination of ethylene (per 1 kg reacted Cl); Cd = the heat capacity of dichloroethane (J/kg multiply degree); tbpd(P8) = the boiling point of dichloroethane at the pressure existing at the dichloroethane vapour take-off point; tbpd(P5) = the boiling point of dichloroethane at the pressure existing at the upper boundary of the reaction zone.
USE - The process is used in the preparation of dichloroethane.
ADVANTAGE - Improved absorption of reaction heat and reduced vaporisation of the dichloroethane results in reduced production of high boiling point side products and greater economy in operation.
Dwg.0/0
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: **E10-H03C4**

L109 ANSWER 46 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 1996-078029 [09] WPIX
DOC. NO. CPI: C1996-025858
TITLE: Ethylene di chloride preparation by catalytic chlorination with min. ethylene loss - involves recycling waste gas from prod. separator and allows operation in wide temperature and pressure range..
DERWENT CLASS: E16 J04
INVENTOR(S): EICHLER, J; MIELKE, I; SCHWARZMAIER, P; STOGER, M; WILD, T; MIEELKE, I; STOEGER, M
PATENT ASSIGNEE(S): (FARH) HOECHST AG; (VINN-N) VINNOLIT MONOMER GMBH & CO KG
COUNTRY COUNT: 64
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC

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DE 4425872      A1 19960125 (199609)*       4 C07C019-045<--
WO 9603361      A1 19960208 (199612)  GE   14 C07C017-02<--
   RW: AT BE CH DE DK ES FR GB GR IE IT KE LU MC MW NL OA PT SD SE SZ UG
    W: AM AU BB BG BR BY CA CN CZ EE FI GE HU IS JP KG KP KR KZ LK LR LT
       LV MD MG MN MX NO NZ PL RO RU SG SI SK TJ TM TT UA UZ VN
AU 9531118      A  19960222 (199621)          C07C017-02<--
ZA 9506058      A  19960424 (199622)       10 C07C000-00<--
NO 9700237      A  19970120 (199716)          C07C017-02<--
FI 9700216      A  19970117 (199717)          C07C000-00<--
EP 772576       A1 19970514 (199724)  GE      C07C017-02<--
    R: BE DE ES FR GB GR IT NL SE
CZ 9700112      A3 19970514 (199726)          C07C017-02<--
SK 9700062      A3 19970604 (199733)          C07C017-02<--
BR 9508311      A  19971223 (199806)          C07C017-02<--
JP 10502932     W  19980317 (199821)       10 C07C019-045<--
MX 9700531      A1 19970401 (199821)          C07C017-02<--
HU 77001        T  19980128 (199825)          C07C017-02<--
AU 693583       B  19980702 (199837)          C07C017-02<--
KR 97704650     A  19970906 (199839)          C07C019-045<--
EP 772576       B1 19990120 (199908)  GE      C07C017-02<--
    R: BE DE ES FR GB GR IT NL SE
DE 59504920     G  19990304 (199915)          C07C017-02<--
CN 1152903      A  19970625 (200134)          C07C017-02<--
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APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
DE 4425872	A1	DE 1994-4425872	19940721	<--
WO 9603361	A1	WO 1995-EP2787	19950715	<--
AU 9531118	A	AU 1995-31118	19950715	<--
ZA 9506058	A	ZA 1995-6058	19950720	<--
NO 9700237	A	WO 1995-EP2787	19950715	<--
		NO 1997-237	19970120	<--
FI 9700216	A	WO 1995-EP2787	19950715	<--
		FI 1997-216	19970117	<--
EP 772576	A1	EP 1995-926901	19950715	<--
		WO 1995-EP2787	19950715	<--
CZ 9700112	A3	WO 1995-EP2787	19950715	<--
		CZ 1997-112	19950715	<--
SK 9700062	A3	WO 1995-EP2787	19950715	<--
		SK 1997-62	19950715	<--
BR 9508311	A	BR 1995-8311	19950715	<--
		WO 1995-EP2787	19950715	<--
JP 10502932	W	WO 1995-EP2787	19950715	<--
		JP 1996-505420	19950715	<--
MX 9700531	A1	MX 1997-531	19970120	<--
HU 77001	T	WO 1995-EP2787	19950715	<--
		HU 1997-155	19950715	<--
AU 693583	B	AU 1995-31118	19950715	<--
KR 97704650	A	WO 1995-EP2787	19950715	<--
		KR 1997-700384	19970121	<--
EP 772576	B1	EP 1995-926901	19950715	<--
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DE 59504920	G	DE 1995-504920	19950715	<--
		EP 1995-926901	19950715	<--
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CN 1152903	A	CN 1995-194121	19950715	<--

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 9531118	A	Based on	WO 9603361
EP 772576	A1	Based on	WO 9603361
CZ 9700112	A3	Based on	WO 9603361
BR 9508311	A	Based on	WO 9603361
JP 10502932	W	Based on	WO 9603361
HU 77001	T	Based on	WO 9603361
AU 693583	B	Previous Publ.	AU 9531118
		Based on	WO 9603361
KR 97704650	A	Based on	WO 9603361
EP 772576	B1	Based on	WO 9603361
DE 59504920	G	Based on	EP 772576
		Based on	WO 9603361

PRIORITY APPLN. INFO: **DE 1994-4425872**, **19940721**
REFERENCE PATENTS: DE 4318609; EP 75742
INT. PATENT CLASSIF.:
MAIN: C07C000-00; **C07C017-02**; **C07C019-045**
SECONDARY: B01J027-128; C07C017-04
ADDITIONAL: C07B061-00
BASIC ABSTRACT:
DE 4425872 A UPAB: 19990224
Production of 1,2-dichloroethane (I) involves feeding Cl2 and C2H4 into **circulating** (I) containing a catalyst system of FeCl3, a gp. IA or IIA metal halide (II) and small amts. of oxygen, passing a side stream of the reaction mixture to vaporisation by reducing the pressure and separating (I) vapour from more readily volatile constituents (III) and isolating (I). The novel features are that (a) (III) are recycled to the reaction; and (b) the following combination of process parameters is excluded: (i) (II) is NaCl and the NaCl:FeCl3 molar ratio remains below 0.5 throughout reaction; (ii) vaporisation by reducing the pressure is carried out in a vessel under vacuum; and (iii) waste gas containing C2H4 is recycled to the reaction with a compressor.
ADVANTAGE - The process is extremely versatile, since it can operate in wide temperature and pressure ranges, and minimises the loss of C2H4.
Dwg.0/1
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: **E10-H03C4**; J04-E01; N01-A; N01-A01; N01-B; N02-A; N04-D01

L109 ANSWER 47 OF 64 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 1996-074782 [08] WPIX
DOC. NO. CPI: C1996-024283
TITLE: Preparation of 1,2-di chloroethane for vinyl chloride monomer material - comprises reacting ethylene with chlorine in solvent in presence of oxygen and metal chloride catalyst using static mixer.
DERWENT CLASS: E16
PATENT ASSIGNEE(S): (TOYJ) TOSOH CORP
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
JP 07330639	A	19951219	(199608)*		5	C07C019-045<--
JP 3653743	B2	20050602	(200537)		7	C07C017-02<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE	
JP 07330639	A	JP 1994-127398	19940609	<--
JP 3653743	B2	JP 1994-127398	19940609	<--

FILING DETAILS:

PATENT NO	KIND	PATENT NO
JP 3653743	B2 Previous Publ.	JP 07330639

PRIORITY APPLN. INFO: **JP 1994-127398**
19940609
INT. PATENT CLASSIF.:
MAIN: **C07C017-02; C07C019-045**
SECONDARY: B01J027-128
ADDITIONAL: C07B061-00
BASIC ABSTRACT:
JP 07330639 A UPAB: 19960227
Preparation of 1,2-dichloroethane (I) comprises reaction of ethylene with chlorine in (I) solvent in the presence of a small amount of oxygen and metal chloride catalyst. Ethylene and chlorine are bubbled with a static mixer to produce bubbles with an average dia. of upto 2.0 mm, and fed into a solution **circulation**-type reactor under the conditions that the solution superficial velocity in a column (SV) is 0.2-1.5 m/s, the ratio of ethylene gas SV/solution SV is upto 0.50, the value of ethylene gas SV/solution SV power 2 is upto 1.0 and the reaction temperature is 70-160 degrees C.

Pref. metal chloride is ferric chloride. The molar ratio of supplying chlorine/ethylene is 0.98-1.02. Oxygen partial pressure is 50 kPa and the reaction pressure is 200-800 kPa.

USE/ADVANTAGE - Used as a material for vinyl chloride monomers and ethylene diamine. By-production of 1,1,2-trichloroethane is controlled so that (I) is prepared in 99.8% yield with 99.9% selectivity and 99.9% conversion of ethylene.

In an example, 1,2-dichloroethane solvent was **circulated** into a reactor at ascending mode at 14.0 m3/h solution flow rate at 0.50 m/s solution SV. Ethylene gas was fed at 8.0 Nm3/h from a nozzle below and chlorine gas containing 1.0 vol% oxygen was fed at 8.1 Nm3/h from an another nozzle below. The molar ratio of chlorine/ethylene was 1.002. The reaction was carried out at 100 deg.C under 396 kPa while taking out the overflowing reaction solution while supplying ferric chloride. Ethylene gas SV was 0.10 m/s, the average bubble dia. of ethylene and chlorine was 1.4 mm and the concentration of ferric chloride catalyst was 280 weight ppm.
Dwg.0/0
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: **E10-H03C4**; N02-A; N04-D01

=> d ibib ed ab hitind 48-
YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' - CONTINUE? (Y)/N:y

YOU HAVE REQUESTED DATA FROM 17 ANSWERS - CONTINUE? Y/(N):y

L109 ANSWER 48 OF 64 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on

STN
ACCESSION NUMBER: 2003:19416 BIOSIS
DOCUMENT NUMBER: PREV200300019416
TITLE: Field demonstration of successful bioaugmentation to achieve dechlorination of tetrachloroethene to ethene.
AUTHOR(S): Major, David W. [Reprint Author]; McMaster, Michaye L.; Cox, Evan E.; Edwards, Elizabeth A.; Dworatzek, Sandra M.; Hendrickson, Edwin R.; Starr, Mark G.; Payne, Jo Ann; Buonamici, Lois W.
CORPORATE SOURCE: Central Research and Development, E.I. DuPont de Nemours and Company, Inc., Glasgow 300, P.O. Box 6101, Newark, DE, 19714-6101, USA
dmajor@geosyntec.com
SOURCE: Environmental Science & Technology, (December 1 2002) Vol. 36, No. 23, pp. 5106-5116. print.
ISSN: 0013-936X (ISSN print).
DOCUMENT TYPE: Article
LANGUAGE: English
ENTRY DATE: Entered STN: 1 Jan 2003
Last Updated on STN: 1 Jan 2003
ED Entered STN: 1 Jan 2003
Last Updated on STN: 1 Jan 2003
AB A laboratory microcosm study and a pilot scale field test were conducted to evaluate biostimulation and bioaugmentation to dechlorinate tetrachloroethene (PCE) to ethene at Kelly Air Force Base. The site groundwater contained about 1 mg/L of PCE and lower amounts of trichloroethene (TCE) and cis-1,2-dichloroethene (cDCE). Laboratory microcosms inoculated with soil and groundwater from the site exhibited partial dechlorination of TCE to cDCE when amended with lactate or methanol. Following the addition of a dechlorinating enrichment culture, KB-1, the **chlorinated ethenes** in the microcosms were completely converted to ethene. The KB-1 culture is a natural dechlorinating microbial consortium that contains phylogenetic relatives of Dehalococcoides ethenogenes. The ability of KB-1 to stimulate biodegradation of **chlorinated ethenes** in situ was explored using a closed loop **recirculation** cell with a pore volume of approximately 64 000 L. The pilot test area (PTA) groundwater was first amended with methanol and acetate to establish reducing conditions. Under these conditions, dechlorination of PCE to cDCE was observed. Thirteen liters of the KB-1 culture were then injected into the subsurface. Within 200 days, the concentrations of PCE, TCE, and cis-1,2-DCE within the PTA were all below 5 mug/L, and ethene production accounted for the observed mass loss. The maximum rates of dechlorination estimated from field data were rapid (half-lives of a few hours). Throughout the pilot test period, groundwater samples were assayed for the presence of Dehalococcoides using both a Dehalococcoides-specific PCR assay and 16S rDNA sequence information. The sequences detected in the PTA after bioaugmentation were specific to the Dehalococcoides species in the KB-1 culture. These sequences were observed to progressively increase in abundance and spread downgradient within the PTA. These results confirm that organisms in;the KB-1 culture populated the PTA aquifer and contributed to the stimulation of dechlorination beyond cDCE to ethene.
CC Ecology: environmental biology - General and methods 07502
Biochemistry studies - General 10060
Biochemistry studies - Nucleic acids, purines and pyrimidines 10062
Physiology and biochemistry of bacteria 31000
Public health - Air, water and soil pollution 37015
Food microbiology - General and miscellaneous 39008
IT Major Concepts
Bioprocess Engineering; Groundwater Ecology (Ecology, Environmental

Sciences); Pollution Assessment Control and Management
IT Chemicals & Biochemicals
16S rDNA [16S ribosomal DNA]; cis-1,2-dichloroethene [cDCE]: water pollutant; ethene; lactate; methanol; tetrachloroethene [PCE]: dechlorination, water pollutant; trichloroethene [TCE]: water pollutant
IT Methods & Equipment
bioaugmentation: applied and field techniques; closed loop **recirculation** cell: field equipment; polymerase chain reaction assay [PCR assay]: genetic techniques, laboratory techniques
IT Miscellaneous Descriptors
groundwater contamination; laboratory microcosm study; pilot scale field test
GT Kelly Air Force Base (Texas, USA, North America, Nearctic region)
ORGN Classifier
Bacteria 05000
Super Taxa
Microorganisms
Organism Name
Dehalococcoides ethenogenes (species)
Taxa Notes
Bacteria, Eubacteria, Microorganisms
ORGN Classifier
Microorganisms 01000
Super Taxa
Microorganisms
Organism Name
microbe (common): KB-1 dechlorinating enrichment culture
Taxa Notes
Microorganisms
RN 156-59-2 (cis-1,2-dichloroethene)
156-59-2 (cDCE)
74-85-1 (ethene)
113-21-3 (lactate)
67-56-1 (methanol)
127-18-4 (tetrachloroethene)
127-18-4 (PCE)
79-01-6 (trichloroethene)
79-01-6 (TCE)

L109 ANSWER 49 OF 64 PASCAL ©PYRIGHT 2005 INIST-CNRS. ALL RIGHTS RESERVED.
on STN
ACCESSION NUMBER: 1999-0489548 PASCAL
COPYRIGHT NOTICE: Copyright .COPYRGT. 1999 INIST-CNRS. All rights reserved.
TITLE (IN ENGLISH): Modelling and simulation of a bubble-column reactor with external loop : Application to the **direct chlorination** of **ethylene**
4th International Conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering
AUTHOR: OREJAS J. A.
MUDDE Robert F. (ed.); VAN DEN AKKER H. E. A. (ed.)
CORPORATE SOURCE: Universidad Nacional de Rio Cuarto, Facultad de Ingenieria, Ruta Nac. 36, Km. 601-5800, Rio Cuarto, Argentina
Kramers Laboratorium voor Fysische Technologie, Delft University of Technology, Prins Bernhardlaan 6, 2628 BW Delft, Netherlands
Delft University of Technology. Kramers Laboratorium voor Fysische Technologie, Netherlands (patr.)
SOURCE: Chemical engineering science, **(1999)**,

54(21), 5299-5309, 27 refs.
Conference: 4 International Conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering, Delft (Netherlands), 23 Aug 1999
ISSN: 0009-2509 CODEN: CESCAC
DOCUMENT TYPE: Journal; Conference
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: United Kingdom
LANGUAGE: English
AVAILABILITY: INIST-7538, 354000085914720720
UP 20001101
AB An industrial process for the **direct chlorination** of **ethylene** at low temperatures to yield 1,2-dichloroethane has been considered. The reactor, whose configuration corresponds to a bubble column with external recirculation loop, has a working capacity of 19 m.sup.3 and a production capacity of 54000 ton of 1,2-dichloroethane per year. In order to describe its operation, both a model and a numerical simulation program were developed. In the model, the distinctive features of the different zones that constitute the reactor were considered in detail. The predictions obtained with the simulation program were compared with experimental measurements taken at the real plant for a wide range of operating conditions. Predicted values for different variables that characterise the reactor's operation proved to be very good approximations.

L109 ANSWER 50 OF 64 PASCAL COPYRIGHT 2005 INIST-CNRS. ALL RIGHTS RESERVED. on STN
ACCESSION NUMBER: 1999-0273595 PASCAL
COPYRIGHT NOTICE: Copyright .COPYRGT. 1999 INIST-CNRS. All rights reserved.
TITLE (IN ENGLISH): A case study for reactor network synthesis : the vinyl chloride process
Special Issue: Selected and extended papers from the Symposium on PSE'97/ESCAPE'7
AUTHOR: LAKSHMANAN A.; ROONEY W. C.; BIEGLER L. T.
SKOGESTAD Sigurd (ed.)
CORPORATE SOURCE: Chemical Engineering Department, Chemical Mellon University, Pittsburgh, PA 15213, United States
Department of Chemical Engineering, Norwegian University of Science and Technology, 7491 Trondheim, Norway
SOURCE: Computers & chemical engineering, (1999), 23(4-5), 479-495, 43 refs.
ISSN: 0098-1354 CODEN: CCENDW
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: United Kingdom
LANGUAGE: English
AVAILABILITY: INIST-16409, 354000084273390020
UP 20001101
AB A key objective of the integrated reactor network synthesis approach is the development of waste minimizing process flowsheets (Lakshmanan & Biegler, 1995). With increasing environmental concerns in process design, there is a particularly strong need to maximize conversion to product and avoid generation of wasteful byproducts within the reactor network. This also avoids expensive treatment and separation costs downstream in the process. In this study, we present an application of the mixed integer nonlinear programming (MINLP)-based reactor network synthesis strategy developed by Lakshmanan and Biegler (1996). We focus on applying these reactor network synthesis concepts to the vinyl chloride monomer

production process. Vinyl chloride is currently produced by a balanced production process from ethylene, chlorine and oxygen with three separate reaction sections: oxychlorination of **ethylene**; **direct chlorination** of **ethylene**; and pyrolysis of **ethylene** dichloride. The hydrogen chloride produced in the pyrolysis reactor is used completely in the oxychlorination reactor. Byproducts such as chlorinated hydrocarbons and carbon oxides are generated by these reaction sections. These are studied using reaction kinetic models for the three reaction sections. The case study results in optimal reactor networks that improve the conversion of ethylene to vinyl chloride and minimize the formation of byproducts. These results are used to generate an improved flowsheet for the production of vinyl chloride monomer. Moreover, an overall profit maximization, that includes the effect of heat integration, is presented and a set of recommendations that improve the selectivity of vinyl chloride production are outlined. Finally, the optimal reactor structures, overall conversion and annual profit are shown to be only mildly sensitive with respect to small changes in the kinetic parameters.

L109 ANSWER 51 OF 64 PASCAL COPYRIGHT 2005 INIST-CNRS. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 1998-0411989 PASCAL
COPYRIGHT NOTICE: Copyright .COPYRGT. 1998 INIST-CNRS. All rights reserved.
TITLE (IN ENGLISH): Recovery of polymer powder from chlorination solutions
TITLE (IN GERMAN): Polymerpulvergewinnung aus Chlorierloesungen
AUTHOR: MEINHARDT J.; FRIESE K.; WICHTEREY E.; HOESSELBARTH B.
CORPORATE SOURCE: Institut fuer Oberflaechenmodifizierung e.V., Permoserstrasse 15, 04318 Leipzig, Germany, Federal Republic of; Chemie AG Bitterfeld, Zoerbiger Strasse, 06749 Bitterfeld, Germany, Federal Republic of
SOURCE: Die Angewandte makromolekulare Chemie, **(1998)** (258), 19-26, 7 refs.
ISSN: 0003-3146 CODEN: ANMCBO
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: Switzerland
LANGUAGE: German
SUMMARY LANGUAGE: English
AVAILABILITY: INIST-13869, 354000070516760040
UP 20001101
AB A general process for obtaining powders of solution-chlorinated polymers with residual solvent content of less than 0.1% has been presented. The developed emulsion-precipitation process makes use of conventional technological equipment, it can be carried out in a closed **circulation** loop and it is free of wastes. The conditions of the technological process applied to chlorinated PVC, PE and NR differ only very little.

L109 ANSWER 52 OF 64 PASCAL COPYRIGHT 2005 INIST-CNRS. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 1997-0355874 PASCAL
COPYRIGHT NOTICE: Copyright .COPYRGT. 1997 INIST-CNRS. All rights reserved.
TITLE (IN ENGLISH): A case study for reactor network synthesis : The vinyl chloride process
AUTHOR: LAKSHMANAN A.; BIEGLER L. T.
SKOGESTAD Sigurd (ed.)
CORPORATE SOURCE: Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA 15213, United States

Norwegian University of Science and Technology, Trondheim, Norway
SOURCE: Computers & chemical engineering, **(1997)**, 21(SUP), S785-S790, 18 refs.
Conference: PSE'97-ESCAPE-7. Symposium; Joint 6th International Symposium on Process Systems Engineering and 30th European Symposium on Computer Aided Process Engineering, Trondheim (Norway); Trondheim (Norway), **25 May 1997; 25 May 1997**
ISSN: 0098-1354 CODEN: CCENDW
DOCUMENT TYPE: Journal; Conference; (case report, clinical case)
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: United Kingdom
LANGUAGE: English
AVAILABILITY: INIST-16409, 354000061554601290
UP 20001031
AB A key objective of the integrated reactor network synthesis approach is the development of waste minimizing process flowsheets (Lakshmanan and Biegler, 1994). With increasing environmental concerns in process design, there is a particularly strong need to avoid the generation of wasteful or harmful byproducts within the reactor network. This also avoids expensive treatment and separation costs downstream in the process. In this study. we focus on the application of integrated reactor network synthesis concepts for the vinyl chloride process. Vinyl chloride is currently produced by a balanced process from ethylene, chlorine and oxygen with three separate reaction sections: oxychlorination of **ethylene**, **direct chlorination** of **ethylene** and pyrolysis of **ethylene** dichloride, with the hydrogen chloride produced in the pyrolysis reactor used completely in the oxychlorination reactor. Each of these reaction sections generate chlorinated hydrocarbons and carbon oxides as byproducts. Detailed kinetic models for the three reaction sections are used to develop optimal reactor networks which improve the conversion of ethylene to vinyl chloride product and minimize the production of by-products. This case study presents an application of the mixed integer nonlinear programming based reactor network synthesis strategy (Lakshmanan and Biegler, 1996a). A candidate flowsheet is proposed based on these results and a set of recommendations is given to improve the selectivity of vinyl chloride production.

L109 ANSWER 53 OF 64 PASCAL COPYRIGHT 2005 INIST-CNRS. ALL RIGHTS RESERVED.
on STN
ACCESSION NUMBER: 1993-0022958 PASCAL
TITLE (IN ENGLISH): Study of the industrial process of **direct chlorination** of **ethylene**
AUTHOR: AVET'YAN M. G.; SONIN E. V.; ZAIDMAN O. A.; EMEL'YANOV V. I.; KRISHTAL N. F.; MUBARAKOV R. G.; PEREVALOV A. F.; POPOV V. E.; ROZHKOV V. I.; TREGER YU. A.; FLID M. R.; KHARITONOV V. I.
SOURCE: Soviet Chemical Industry, (1991), 23(12), 6-10, 2 refs.
ISSN: 0038-5344
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: United States
LANGUAGE: English
NOTE: Trad. de Khimicheskaya Promyshlennost, 1991, vol. 23, no. 12, pp. 710-712
AVAILABILITY: INIST-17134, 354000031668660020
UP 20001027

L109 ANSWER 54 OF 64 PASCAL COPYRIGHT 2005 INIST-CNRS. ALL RIGHTS RESERVED. on STN
ACCESSION NUMBER: 1992-0289565 PASCAL
TITLE (IN ENGLISH): Industrial introduction of a reactor for **direct chlorination** of **ethylene** combined with a rectification column
AUTHOR: AVET'YAN M. G.; SONIN E. V.; ZAIDMAN O. A.; EMEL'YANOV V. I.; KRISHTAL N. F.; MUBARAKOV R. G.; PEREVALOV A. F.; ROZHKOV V. I.; TREGER YU. A.; KHARITONOV V. I.; FLID M. R.
SOURCE: Soviet Chemical Industry, **(1991)**, 23(6), 1-6, 5 refs.
ISSN: 0038-5344
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: United States
LANGUAGE: English
NOTE: Trad. de Khimicheskaya Promyshlennost, SU, 1991, 23, 6, 323-326
AVAILABILITY: INIST-17134, 354000029686500010
UP 20001027

L109 ANSWER 55 OF 64 JICST-EPlus COPYRIGHT 2005 JST on STN
ACCESSION NUMBER: 1020048268 JICST-EPlus
TITLE: Reaction Mechanism of Photocatalytic Degradation of **Chlorinated Ethylenes** over Porous TiO2 Pellets.
AUTHOR: YAMAZAKI SUZUKO; ARAKI KENSUKE
HORI KENJI
CORPORATE SOURCE: Yamaguchi Univ., Fac. of Sci.
Yamaguchi Univ., Fac. of Eng.
SOURCE: Kokagaku Toronkai Koen Yoshishu, (2001) vol. 2001, pp. 344.
Journal Code: L0850A (Tbl. 1)
PUB. COUNTRY: Japan
DOCUMENT TYPE: Conference; Short Communication
LANGUAGE: Japanese
STATUS: New
AB The photo-assisted catalytic degradation of mono-, tri-, or tetrachloroethylene was studied in a tubular photoreactor packed with porous TiO2 pellets which were prepared by sol-gel method. The experiments were performed in a non-**circulating** mode. Reaction intermediates adsorbed on the TiO2 pellets were extracted with ether and identified by NMR analysis. The concentrations of Cl2 and Cl- as products were determined by ion-chromatography after passing the product gas stream through an ionized water and immersing the pellets into water. The theoretical calculations at the MP4/6-31G**//B3LYP/6-31G** level were performed to estimate exothermic energies for an addition of Cl or OH radicals on the **chlorinated ethylenes.** The degradation mechanism of the **chlorinated ethylenes** was elucidated on the basis of the experimental data and the theoretical calculations. (author abst.)

L109 ANSWER 56 OF 64 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 2002(40):1203 COMPENDEX
TITLE: Applications of **direct chlorination** technique in chloroethylene production revamping.
AUTHOR: Xu, Heng-Jin (Dept. of Eng. Mgmt. Qilu Petrochem. Co. Ltd., Zibo 255408, China)
SOURCE: Huagong Xiandai/Modern Chemical Industry v 22 n 5 May

2002 2002.p 42-44
CODEN: HTKUDJ ISSN: 0253-4320
PUBLICATION YEAR: 2002
DOCUMENT TYPE: Journal
TREATMENT CODE: Application
LANGUAGE: Chinese
AB Effects from high-temperature and low-temperature **direct chlorination** on refining, energy saving and economics of ethylene chloride in chloroethylene production revamping are analyzed. High-temperature **chlorination** can reduce revamping workload in **ethylene** chloride refining units. Energy per ton of ethylene chloride can be down by 1626 MJ after revamping of **direct chlorination** units. 3 Refs.

L109 ANSWER 57 OF 64 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 1996(31):1901 COMPENDEX
TITLE: Revamp of Ukraine VCM plant will boost capacity, reduce emissions.
AUTHOR: Anon
SOURCE: Oil and Gas Journal v 94 n 20 May 13 1996.p 60-61
CODEN: OIGJAV ISSN: 0030-1388
PUBLICATION YEAR: 1996
DOCUMENT TYPE: Journal
TREATMENT CODE: General Review
LANGUAGE: English
AB Oriana Concern is revamping its 250,000 metric ton/year (mty) vinyl chloride monomer (VCM) plant at Kalusch, Ukraine. At the core of the project are a new **ethylene** dichloride cracking furnace and **direct chlorination** unit, and revamp of an oxychlorination unit to use oxygen rather than air. The plant expansion and modernization will boost capacity to 370,000 mty. New facilities for by-product recycling and recovery, waste water treatment, and emissions reduction will improve the plant's environmental performance. The expected feedstock and utility consumption for VCM production is shown. A schematic of the VCM process being used for the plant revamp is presented.

L109 ANSWER 58 OF 64 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 1991(1):1403 COMPENDEX
DOCUMENT NUMBER: 91017407
TITLE: Aerosol direct fluorination of C1 and C2 chlorocarbons.
AUTHOR: Adcock, James L. (Univ of Tennessee, Knoxville, TN, USA); Kunda, Sastry A.; Taylor, Donald R.; Nappa, Mario J.; Sievert, Allen C.
SOURCE: Ind Eng Chem Res v 28 n 10 Oct 1989 p 1547-1549
CODEN: IECRED ISSN: 0888-5885
PUBLICATION YEAR: 1989
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
LANGUAGE: English
AB Aerosol **direct** fluorination of **chlorinated** methanes and **ethanes** has been found to produce perfluorinated analogues in good yields.The focus of this study was the fluorination of one- and two-carbon alkyl chlorides, with the goal of understanding the nature of fluorine reactivity with these compounds under the lower acidity, fluoride ion rich conditions prevalent in the aerosol fluorination process.Aerosol fluorination was viewed as a potential avenue of synthesis of the industrially important chlorofluorocarbons (CFS's) and hydrochlorofluorocarbons (HCFC's) such CFC-11 (CFCl3), HCFC-22 (CHF2Cl), and CFC-113 (CF2ClCFCl2). (Author abstract) 19 Refs.

L109 ANSWER 59 OF 64 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 1982(2):2416 COMPENDEX
DOCUMENT NUMBER: 82029886
TITLE: RECOVER PRODUCTS FROM CHLOROHYDROCARBON RESIDUES.
AUTHOR: Scharein, Gunter (Chem Werke Huels, Marl, Ger)
SOURCE: Hydrocarbon Process v 60 n 9 Sep 1981 p 193-194
CODEN: HYPRAX ISSN: 0018-8190
PUBLICATION YEAR: **1981**
LANGUAGE: English

AB All processes for the manufacture of chlorohydrocarbons also yield some undesirable by-products boiling at relatively high temperatures which yield solid residues upon evaporation. The by-products are generally dissolved or suspended in the desired chlorohydrocarbons and include elemental carbon as carbon black, oligomeric and polymeric compounds of partly tarry consistency and more highly chlorinated or perchlorinated alphatic and aromatic compounds as well as, with certain processes, the necessary catalysts. This paper describes a new method, developed in West Germany, for the recovery of useful products from vinyl chloride (VC) production residues and simultaneously removing environmental pollution by chlorine-containing by-products. The vinyl monomer is produced from **ethylene** by **direct chlorination** to 1,2-dichloroethane (EDC) in a boiling reactor. At several points in the EDC and VC manufacturing plant, product streams are continuously removed from the process according to specific criteria by concentration or high boilers and residues. They are further treated by a process that is environmentally compatible and, because of almost complete EDC recovery, economically efficient. Details of the process are given.

L109 ANSWER 60 OF 64 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 1976(7):3382 COMPENDEX
DOCUMENT NUMBER: 760743131
TITLE: OXIDATION OF **CHLORINATED ETHYLENES** AND OTHER **CHLORINATED** COMPOUNDS.
AUTHOR: Gay, Bruce W. Jr. (EPA, Environ Sci Res Lab, Research Triangle Park, NC); Hanst, Philip L.; Bufalini, Joseph J.; Noonan, Richard C.
SOURCE: Am Chem Soc Div Environ Chem Prepr v 16 n 1 1976, for Symp on Chem of Air Pollut at Am Chem Soc 171st Natl Meet, New York, NY, Apr 4-9 1976 p 233-238
CODEN: ACEPCF
PUBLICATION YEAR: **1976**
LANGUAGE: English

AB Large quantities of **chlorinated ethylenes** are released daily into the atmosphere. These compounds undergo photochemical reactions in the presence of oxides of nitrogen and sunlight. Of primary interest to atmospheric studies of these compounds are rates of photooxidation, identity of intermediates and final products and rates of ozone formation. More recently attention has been **directed** toward the **chlorinated ethylenes** and their photooxidation products as to possible influx into the stratosphere where detrimental interaction of chlorine from the compounds and ozone takes place. The photooxidation of **ethylene** and **chlorinated ethylenes** is summarized. Chloroform and carbon tetrachloride have been excluded because they react very slowly or not at all in the presence of only nitrogen dioxide and ultraviolet light. Exact comparisons of the reactivities is not possible since a constant ratio of **ethylene** or **chlorinated ethylene** to nitrogen dioxide was not maintained. However, since the ratios are approximately constant, the reactivities are at least semiquantitative. Products of the photooxidation

of these compounds are discussed for each compound. 1 reference

L109 ANSWER 61 OF 64 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 1975(10):5777 COMPENDEX
DOCUMENT NUMBER: 751064520
TITLE: Behavior of Polychloroethylenes under Conditions of Synthesis of 1,2-Dichloroethane.
POVEDENIE POLIKHLORETILENOV V USLOVIYAKH POLUCHENIYA 1,2-DIKHLORETANA.
AUTHOR: Pimenov, I.F.; Zorina, G.O.; Zanaveskin, L.N.
SOURCE: Khim Prom n 6 1975 p 11-12
CODEN: KPRMAW
PUBLICATION YEAR: 1975
LANGUAGE: Russian
AB A study was made of the behavior of the polychloroethylenes formed as by-products of pyrolysis of 1,2-dichloroethane synthesized by **direct** oxidative **chlorination** of **ethylene.** It is shown that under the given conditions the degree of chlorination of polychloroethylenes amounts to 75-90%. This makes it possible to remove these impurities from 1,2-dichloroethane which has not reacted during the pyrolysis stage in a reactor used for the synthesis of dichloroethane by liquid-phase **chlorination** of **ethylene.** In Russian.

L109 ANSWER 62 OF 64 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 1971(6):3498 COMPENDEX
DOCUMENT NUMBER: 710635056
TITLE: Production of vinyl chloride in a pilot plant by **direct chlorination** of **ethylene** in a fluidized catalyst bed.
AUTHOR: ALIEV VS; MAMEDOV MA; BUSEINVO MM; POPOVA TP; AGAEV MT
SOURCE: Zh Prikl Khim v 43 n 3 Mar 1970 p 616-20.See also English translation in J Appl Chem USSR v 43 n 3 Mar 1970 p 619-22
CODEN: ZPKHA
PUBLICATION YEAR: 1970
LANGUAGE: English
AB Laboratory investigations of production of vinyl chloride by high-temperature chlorination showed that the process conditions can be controlled better in systems with moving beds than in volume chlorination. This paper reports the results of moving bed **ethylene chlorination** in a pilot plant. The maximum yield of vinyl chloride is obtained at 450 C at 4 to 1 molar ratio of ethylene to chlorine. At (500 C andin presence of a considerable molar excess of ethylene, small amounts of chloromethanes and hydrogen are found in the reaction products. 35056

L109 ANSWER 63 OF 64 SCISEARCH COPYRIGHT (c) 2005 The Thomson Corporation on STN
ACCESSION NUMBER: 1997:443896 SCISEARCH
THE GENUINE ARTICLE: XD313
TITLE: A case study for reactor network synthesis: The vinyl chloride process
AUTHOR: Lakshmanan A (Reprint); Biegler L T
CORPORATE SOURCE: CARNEGIE MELLON UNIV, DEPT CHEM ENGN, PITTSBURGH, PA 15213 (Reprint)
COUNTRY OF AUTHOR: USA
SOURCE: COMPUTERS & CHEMICAL ENGINEERING, (**1997**) Vol. 21, Supp. [S], pp. S785-S790.
ISSN: 0098-1354.
PUBLISHER: PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD, LANGFORD

LANE, KIDLINGTON, OXFORD, ENGLAND OX5 1GB.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: ENGI
LANGUAGE: English
REFERENCE COUNT: 18
ENTRY DATE: Entered STN: 1997
Last Updated on STN: 1997
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

ED Entered STN: 1997
Last Updated on STN: 1997

AB A key objective of the integrated reactor network synthesis approach is the development of waste minimizing process flowsheets (Lakshmanan and Biegler, 1994). With increasing environmental concerns in process design, there is a particularly strong need to avoid the generation of wasteful or harmful byproducts within the reactor network. This also avoids expensive treatment and separation costs downstream in the process. In this study, we focus on the application of integrated reactor network synthesis concepts for the vinyl chloride process. Vinyl chloride is currently produced by a balanced process from ethylene, chlorine and oxygen with three separate reaction sections: oxychlorination of **ethylene**, **direct chlorination** of **ethylene** and pyrolysis of **ethylene** dichloride, with the hydrogen chloride produced in the pyrolysis reactor used completely in the oxychlorination reactor. Each of these reaction sections generate chlorinated hydrocarbons and carbon oxides as byproducts. Detailed kinetic models for the three reaction sections are used to develop optimal reactor networks which improve the conversion of ethylene to vinyl chloride product and minimize the production of by-products. This case study presents an application of the mixed integer nonlinear programming based reactor network synthesis strategy (Lakshmanan and Biegler, 1996a). A candidate flowsheet is proposed based on these results and a set of recommendations is given to improve the selectivity of vinyl chloride production.

L109 ANSWER 64 OF 64 SCISEARCH COPYRIGHT (c) 2005 The Thomson Corporation on STN
ACCESSION NUMBER: 1991:609384 SCISEARCH
THE GENUINE ARTICLE: GM995
TITLE: INDUSTRIAL RECLAMATION OF **ETHYLENE** **DIRECT CHLORINATION** REACTOR, JOINTED WITH RECTIFICATION COLUMN
AUTHOR: AVETYAN M G (Reprint); SONIN E V; ZAIDMAN O A; EMELYANOV V I; KRISHTAL N F; MUBARAKOV R G; PEREVALOV A F; ROZHKOV V I; TREGER Y A; KHARITONOV V I; FLID M P
SOURCE: KHIMICHESKAYA PROMYSHLENNOST, (**1991**) No. 6, pp. 323-326.
ISSN: 0023-110X.
PUBLISHER: KHIMIYA, N KRASNOSLESKAYA 37, B-66 MOSCOW, RUSSIA.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: ENGI
LANGUAGE: Russian
REFERENCE COUNT: No References Keyed
ENTRY DATE: Entered STN: 1994
Last Updated on STN: 1994

ED Entered STN: 1994
Last Updated on STN: 1994

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=> d que l57
L7              QUE  ABB=ON  PLU=ON  ?CENTRIFUG? OR ?CENTRIPET? OR ?CYCLO
                N? OR ?CIRCULAT?
L8            1 SEA FILE=REGISTRY ABB=ON  PLU=ON  107-06-2/RN
L9        13833 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8
L10         965 SEA FILE=HCAPLUS ABB=ON  PLU=ON  107-06-2P?
L11         965 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9 (L) (PREP+NT)/RL
L12             QUE  ABB=ON  PLU=ON  ?PREP? OR ?SYNTH? OR ?PRODUC? OR FOR
                M? OR YIELD?
L13        2587 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9(L) L12
L14        1723 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L8 (L) (PROC+NT)/RL
L15        4330 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10 OR L11 OR (L13 OR L14)
L16       18990 SEA FILE=HCAPLUS ABB=ON  PLU=ON  CHLORINATION/CT
L17         321 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 AND L16
L19      280481 SEA FILE=HCAPLUS ABB=ON  PLU=ON  REACTORS+PFT,NT/CT
L20        2154 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "SEPARATORS (L) CYCLONES"+PFT,
                NT/CT
L21        2508 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "CYCLONE SEPARATORS"+PFT,NT/CT

L22          24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 AND (L19 OR L20 OR L21)
L23           1 SEA FILE=REGISTRY ABB=ON  PLU=ON  7782-50-5/RN
L30        5786 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "CHLORINE, REACTIONS"/OBI
L32       10938 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 (L) REACTION?
L33       10216 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 (L) (RACT+NT)/RL
L34          80 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 AND (L30 OR L32 OR L33)
L35           8 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND L19
L36           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND (L20 OR L21)
L37          23 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L30 OR L32 OR L33)(L)L7
L38           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND L37
L39           8 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L35 OR L36) OR L38
L45       25129 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (?CHLOROALKANE/OBI OR
                ?CHLOROALKYLENE/OBI OR ?CHLOROPARAFFIN/OBI OR ((?CHLORO/OBI OR
                ?CHLORINAT?/OBI) (2A) (ALKANE/OBI OR ALKYLENE/OBI OR PARAFFIN/O
                BI OR ETHANE/OBI OR ETHYLENE/OBI))) OR ((ALKANE/OBI OR
                ALKYLENE/OBI OR PARAFFIN/OBI)(1W) ?CHLORIDE/OBI)
L46         915 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 (L) (PREP+NT)/RL
L47         563 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 (L) (PROC+NT)/RL
L48        3578 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 (L) L12
L49         565 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L46 OR L47 OR L48) AND (L16
                OR L30 OR L32 OR L33)
L50          29 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 AND L19
L51           1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 AND ((L20 OR L21))
L52           4 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L49 AND (L45 (L) L7)
L53          30 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L50 OR L51 OR L52)
L54          40 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L39 OR L22 OR L53
L55          23 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L54 NOT (ELECTROCHEMICAL OR
                "ELECTRO-ORGANIC" OR OXYCHLORINATION OR HYDROXYCHLORINATION OR
                "TWO-STAGE" OR ELECTROLYTICALLY OR ELASTOMERS)/TI
L56          20 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L55 AND (AY<2003 OR PY<2003
                OR PRY<2003)
L57           3 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L55 NOT L56


=> d his l69

     (FILE 'USPATFULL, USPAT2' ENTERED AT 09:54:47 ON 27 JUL 2005)
L69           1 S L67 NOT L68

=> d que l69
L8            1 SEA FILE=REGISTRY ABB=ON  PLU=ON  107-06-2/RN
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L23           1 SEA FILE=REGISTRY ABB=ON  PLU=ON  7782-50-5/RN
L58        1276 SEA L8
L59        7316 SEA L23
L60          59 SEA L58 AND L59
L63        1506 SEA CHLORINATION/CT
L66          25 SEA L60 AND L63
L67          19 SEA L66 NOT (OXYHALOGENATION OR ETHYLENEOXICHLORINATION OR
                SULPHONIC OR EFFLUENT)/TI
L68          18 SEA L67 AND (AY<2003 OR PY<2003 OR PRY<2003)
L69           1 SEA L67 NOT L68


=> d his l97

     (FILE 'BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' ENTERED AT
     10:41:28 ON 27 JUL 2005)
L97           3 S L95 NOT L96

=> d que l97
L4               QUE  ABB=ON  PLU=ON  ?CHLOROETHANE OR ?CHLOROETHYLENE? OR
                  (?CHLORO(1W)(ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLEN
                 E)(1W) ?CHLORIDE)
L7               QUE  ABB=ON  PLU=ON  ?CENTRIFUG? OR ?CENTRIPET? OR ?CYCLO
                 N? OR ?CIRCULAT?
L12              QUE  ABB=ON  PLU=ON  ?PREP? OR ?SYNTH? OR ?PRODUC? OR FOR
                 M? OR YIELD?
L79        28045 SEA L4
L80         1871 SEA L79 (5A) L12
L82        92223 SEA CHLORINAT? OR HALOGENAT?
L84          388 SEA L80 AND L82
L85           13 SEA L84 AND L7
L86            3 SEA L85 AND CHLORINATION/TI
L88         2393 SEA L82 (5A) (ETHANE OR ETHYLENE OR ETHENE)
L89           29 SEA L88 AND L7
L90          456 SEA L82 (3A) DIRECT?
L91           26 SEA L88 AND L90
L92           52 SEA L89 OR L91
L93           52 SEA L86 OR L92
L94           37 DUP REM L93 (15 DUPLICATES REMOVED)
L95           21 SEA L94 NOT (GROUNDWATER OR MARROW OR ALLOY OR SERUM OR
                ENZYMES OR SCLERODERMA OR COMETABOLIC OR B12 OR BLOOD OR
                AEROBIC OR ANAEROBIC OR RAT OR FISH OR TOXICANTS)/TI
L96           18 SEA L95 AND (AY<2003 OR PY<2003 OR PRY<2003 OR MY<2003)
L97            3 SEA L95 NOT L96


=> dup rem l57 l69 l97
FILE 'HCAPLUS' ENTERED AT 11:06:22 ON 27 JUL 2005
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FILE 'USPATFULL' ENTERED AT 11:06:22 ON 27 JUL 2005
CA INDEXING COPYRIGHT (C) 2005 AMERICAN CHEMICAL SOCIETY (ACS)

FILE 'COMPENDEX' ENTERED AT 11:06:22 ON 27 JUL 2005
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FILE 'SCISEARCH' ENTERED AT 11:06:22 ON 27 JUL 2005
Copyright (c) 2005 The Thomson Corporation
PROCESSING COMPLETED FOR L57
PROCESSING COMPLETED FOR L69
PROCESSING COMPLETED FOR L97
L110            7 DUP REM L57 L69 L97 (0 DUPLICATES REMOVED)
                  ANSWERS '1-3' FROM FILE HCAPLUS
                  ANSWER '4' FROM FILE USPATFULL
                  ANSWER '5' FROM FILE COMPENDEX
                  ANSWERS '6-7' FROM FILE SCISEARCH
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=> d ibib ed ab hitind 1-
YOU HAVE REQUESTED DATA FROM 7 ANSWERS - CONTINUE? Y/(N):y

L110 ANSWER 1 OF 7 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:633569 HCAPLUS
DOCUMENT NUMBER: 141:159052
TITLE: Thermally diluted exothermic reactor system
INVENTOR(S): Hagen, David L.; Ginter, Gary; Goheen, Bill; McGuire, Allan; Rankin, Janet
PATENT ASSIGNEE(S): Vast Power Systems Inc., USA
SOURCE: PCT Int. Appl., 308 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2004064990	A2	20040805	WO 2004-US1749		20040122
WO 2004064990	A3	20041229			

W: AE, AE, AG, AL, AL, AM, AM, AM, AT, AT, AU, AZ, AZ, BA, BB, BG, BG, BR, BR, BW, BY, BY, BZ, BZ, CA, CH, CN, CN, CO, CO, CR, CR, CU, CU, CZ, CZ, DE, DE, DK, DK, DM, DZ, EC, EC, EE, EE, EG, ES, ES, FI, FI, GB, GD, GE, GE, GH, GM, HR, HR, HU, HU, ID, IL, IN, IS, JP, JP, KE, KE, KG, KG, KP, KP, KP, KR, KR, KZ, KZ, KZ, LC, LK, LR, LS, LS, LT, LU, LV, MA, MD, MD, MG, MK, MN, MW, MX, MX, MZ, MZ, NA, NI

US 2004219079	A1	20041104	US 2004-763047		20040122
PRIORITY APPLN. INFO.:			US 2003-442096P	P	20030122
			US 2003-442844P	P	20030124

ED Entered STN: 06 Aug 2004
AB A thermally diluted exothermic reactor system is described comprising numerous orifices distributed in a combustor using distributed perforated contactor tubes or ducts. Diluent fluid and ≥1 reactant fluids are delivered and mixed with an oxidant fluid using the perforated contactors. Reactant fluid, oxidant fluid and diluent fluid are delivered and mixed under composition control using numerous micro-jets about the perforated tubes. Composition profiles, composition ratio profiles and temperature profiles are controlled using the reactor in ≥1 axial direction and one or two transverse directions with temperature gradient reduction, power and efficiency improvement, and emissions control.
IC ICM B01F
CC 47-3 (Apparatus and Plant Equipment)
Section cross-reference(s): 9, 17, 35, 45, 51, 59
IT **Reactors**
(high-pressure; thermally diluted exothermic reactor system)
IT Alkylation
Carbamoylation
Carbonylation
Chlorination
Coal gas
Coal liquids
Combustion
Combustion apparatus
Condensers
Contacting apparatus
Control apparatus

Diesel fuel
Distributing apparatus
Ethoxylation
Exothermic reaction
Fuel oil
Halogenation
Heat exchangers
Heat shields
Hydroformylation
Hydrogenation
Nitration
Oxidation
Oxidizing agents
Shale oils
Sulfation
Sulfonation
Synthesis gas
Thermal insulators
(thermally diluted exothermic reactor system)

IT 64-19-7, Acetic acid, processes 71-43-2, Benzene, processes 74-85-1, Ethylene, processes 84-65-1, Anthraquinone **107-06-2**, Ethylene dichloride, processes 108-95-2, Phenol, processes 110-16-7, Maleic acid, processes 110-82-7, Cyclohexane, processes 115-07-1, Propylene, processes
RL: **CPS (Chemical process)**; **PEP (Physical, engineering or chemical process)**; RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)
(thermally diluted exothermic reactor system)

L110 ANSWER 2 OF 7 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2004:1024972 HCAPLUS
DOCUMENT NUMBER: 141:425582
TITLE: Reactor for direct chlorination of ethylene
INVENTOR(S): Matalinova, E. G.; Dmitriev, Yu. K.; Ermilov, Yu. A.; Yapparov, F. G.; Matalinov, V. I.; Podtsepnyak, S. E.
PATENT ASSIGNEE(S): Zakrytoe Aktsionernoe Obshchestvo "Kaustik", Russia
SOURCE: Russ., No pp. given
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2240861	C1	20041127	RU 2003-125103	20030813

PRIORITY APPLN. INFO.: RU 2003-125103 20030813
ED Entered STN: 30 Nov 2004
AB The reactor for direct chlorination of ethylene contains a cylindrical housing, inlet branch-pipes for ethylene and Cl2, and an outlet for withdrawal of reaction products in the form of vapors together with accompanying gases. The reactor is provided with partitioning grids dividing the reactor along its height to sep. sections and with an internal circulation pipe, the upper part of which is perforated and the perforations are made in the form of the rectangular windows located along the circumference of the circulation pipe at the base of the partitioning grids or at least 1 of the upper sections of the grid. At least 2 plates are uniformly mounted along the periphery of the inner part of the cylindrical housing that form addnl. passages for circulation. The upper and lower edges of the plates are located at the same level of the upper

and lower edges of the inner circulation pipe and are supplied with perforations that is similar to the perforations of the inner circulation pipe. The reactor design allows to increase technol. effectiveness of the process due to uniform circulation of the liquid dichloroethane in the entire area of the partitioning grids of the reactor. The reactor is suitable for production of chlorohydrocarbons by chlorination of olefins, especially production of 1.2-dichloroethane by chlorination of ethylene. The 1.2-dichloroethane is suitable as a solvent and a semi-finished product in industrial syntheses.

IC ICM B01J019-00
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 47
IT **Reactors**
(for direct chlorination of ethylene)
IT **Chlorination**
(reactor for direct chlorination of ethylene)
IT **7782-50-5**, **Chlorine**, **reactions**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in direct chlorination of ethylene)
IT **107-06-2P**, 1.2-Dichloroethane, **preparation**
RL: DEV (Device component use); **IMF (Industrial manufacture)**; **PREP (Preparation)**; USES (Uses)
(reactor for manufacture of 1.2-dichloroethane by direct **chlorination** of **ethylene**)

L110 ANSWER 3 OF 7 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:399135 HCAPLUS
DOCUMENT NUMBER: 138:402123
TITLE: Direct chlorination. Newly developed process steps assure economic viability and selectivity
AUTHOR(S): Benje, Michael
CORPORATE SOURCE: Uhde und Vinnolit, Germany
SOURCE: Chemie-Anlagen + Verfahren (2003), 36(4), 16
CODEN: CHAVBZ; ISSN: 0009-2800
PUBLISHER: Konradin Verlag Robert Kohlhammer
DOCUMENT TYPE: Journal
LANGUAGE: German
ED Entered STN: 26 May 2003
AB Improvements to a direct chlorination process (Vinnolit) for producing dichloroethane (precursor for vinyl chloride) are discussed, including improved entry of Cl2 and ethylene into the reactor and use of a special catalyst system, as well as better heat recovery (≤60%).
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 45
IT **Chlorination**
(apparatus; improvement of direct chlorination process for ethylene to manufacture dichloroethane)
IT **Reactors**
(chlorination apparatus; improvement of direct chlorination process for ethylene to manufacture dichloroethane)
IT 1300-21-6P, Dichloroethane
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(improvement of direct **chlorination** process for **ethylene** to manufacture dichloroethane)
IT 74-85-1, Ethylene, reactions **7782-50-5**, **Chlorine**, **reactions**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(improvement of direct chlorination process for ethylene to manufacture dichloroethane)

L110 ANSWER 4 OF 7 USPATFULL on STN
ACCESSION NUMBER: 2005:63845 USPATFULL
TITLE: Method for reusing heavy end by-products in the manufacture of polychlorinated alkanes
INVENTOR(S): Klausmeyer, Rodney L., Wichita, KS, UNITED STATES
PATENT ASSIGNEE(S): VULCAN CHEMICALS A BUSINESS UNIT OF VULCAN MATERIALS COMPANY (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2005054887	A1	20050310
APPLICATION INFO.:	US 2003-657895	A1	20030909 (10)

DOCUMENT TYPE: Utility
FILE SEGMENT: APPLICATION
LEGAL REPRESENTATIVE: ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP, Leonard Bloom, Senior Counsel, Suite 220, 502 Washington Avenue, Towson, MD, 21204
NUMBER OF CLAIMS: 16
EXEMPLARY CLAIM: 1
NUMBER OF DRAWINGS: 2 Drawing Page(s)
LINE COUNT: 457
CAS INDEXING IS AVAILABLE FOR THIS PATENT.
AB A method for recovering much of the carbon and chlorine value in the heavy ends and other undesired by-products formed during the production of a C.sub.3 or higher polychlorinated alkane through the reaction of carbon tetrachloride with an olefine or chlorinated olefine, the improvement comprising the step of first separating the heavy ends and any other higher or lower boiling chlorohydrocarbon impurities from most of the desired product, and subjecting the separated heavy ends and impurities therewith to a high temperature exhaustive chlorination to produce carbon tetrachloride, tetrachloroethene, and minor amounts of hexachlorobutadiene and hexachlorobenzene by-products.

L110 ANSWER 5 OF 7 COMPENDEX COPYRIGHT 2005 EEI on STN
ACCESSION NUMBER: 2004(29):5312 COMPENDEX
TITLE: Reaction mechanism of photocatalytic degradation of **chlorinated ethylenes** on porous TiO2 pellets: Cl radical-initiated mechanism.
AUTHOR: Yamazaki, Suzuko (Department of Chemistry Faculty of Science Yamaguchi University, Yamaguchi 753-8512, Japan); Tanimura, Toshifumi; Yoshida, Atsushi; Hori, Kenzi
SOURCE: Journal of Physical Chemistry A v 108 n 24 Jun 17 2004. 2004.p 5183-5188
CODEN: JPCAFH ISSN: 1089-5639
PUBLICATION YEAR: 2004
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
LANGUAGE: English
AB The photoassisted catalytic degradation of chloroethylene was studied in a tubular photoreactor packed with TiO2 pellets prepared by a sol-gel method. The experiments were performed in a **noncirculating** mode. Kinetic data and the reaction products were compared with those for the photodegradation of ethylene, trichloroethylene, and tetrachloroethylene. The theoretical calculations at the MP4/6-31G//B3LYP/6-31G level indicated that the addition of OH radicals to **chlorinated ethylenes** is more exothermic than that of Cl radicals by 14.6-29.5 kcal mol-1. Examination of Cl mass balance indicated that the concentration of Cl - collected from the TiO 2 surface was higher than

that from the product gas stream. When the photodegradation of ethylene was performed on the TiO2 pellets which had been used for that of TCE or which were pretreated with HCl, the formation of chloroacetaldehyde was confirmed by the GC/MS. We proposed that during the photodegradation of the **chlorinated ethylenes**, the Cl-, as one of the reaction products, accumulated and was oxidized to Cl radical on the TiO2 surface, which might be due to the oxidation by OH radical. Then, the Cl radical reacted with **chlorinated ethylenes**, leading to the formation of undesirable chlorinated byproducts. 25 Refs.

L110 ANSWER 6 OF 7 SCISEARCH COPYRIGHT (c) 2005 The Thomson Corporation on STN

ACCESSION NUMBER: 2003:274835 SCISEARCH
THE GENUINE ARTICLE: 659AC
TITLE: A review of in situ chemical oxidation and heterogeneity
AUTHOR: Seol Y (Reprint); Zhang H; Schwartz F W
CORPORATE SOURCE: Univ Calif Berkeley, Lawrence Berkeley Lab, 1 Cyclotron Rd, Mail Stop 90R-1116, Berkeley, CA 94720 USA (Reprint); Ohio State Univ, Dept Geol Sci, Columbus, OH 43210 USA
COUNTRY OF AUTHOR: USA
SOURCE: ENVIRONMENTAL & ENGINEERING GEOSCIENCE, (FEB 2003) Vol. 9, No. 1, pp. 37-49.
ISSN: 1078-7275.
PUBLISHER: ASSOC ENGINEERING GEOLOGISTS GEOLOGICAL SOCIETY AMER, 720 S COLORADO BLVD, STE 960-S, DENVER, CO 80246 USA.
DOCUMENT TYPE: General Review; Journal
LANGUAGE: English
REFERENCE COUNT: 50
ENTRY DATE: Entered STN: 11 Apr 2003
Last Updated on STN: 11 Apr 2003
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

ED Entered STN: 11 Apr 2003
Last Updated on STN: 11 Apr 2003

AB Chemical oxidants are increasingly being used for the in situ destruction of organic contaminants in groundwater. The most common implementation involves using an injection/withdrawal system to **circulate** oxidants (e.g., potassium permanganate, hydrogen peroxide, and Fenton's reagent) through a source zone containing a dense non-aqueous phase liquid (DNAPL). Because the efficiency of chemical oxidation is highly dependent on geological heterogeneities, effective delivery schemes are essential for successful remediation. This article reviews the impact of heterogeneities on the success of in situ chemical oxidation. Physical heterogeneities are primarily concerned with the permeable pathways along which oxidants are transported to the zone of contamination. Chemical heterogeneities refer generally to variability in geochemical properties that also bear on the efficiency of oxidant flooding. Both types of heterogeneities work against bringing the oxidant to zones of high contaminant saturations. The highly heterogeneous distribution of contaminants and difficulties in characterization make it difficult to target specific zones for treatment. As a result, large volumes of sediments could be treated whether they are contaminated or not. Heterogeneities in hydraulic conductivity at most sites provide an intensive dose of chemical reagents along permeable pathways and little treatment of low-conductivity zones. Large quantities of oxidizable materials in geologic units are capable of consuming the oxidant during delivery. Reaction products [e.g., CO2, MnO2, and Fe(OH)(3)] tend to plug the porous medium, especially in zones with large contaminant saturations. The oxidant flood is diverted away from these zones, making the flooding inefficient.

L110 ANSWER 7 OF 7 SCISEARCH COPYRIGHT (c) 2005 The Thomson Corporation on STN
ACCESSION NUMBER: 2002:983762 SCISEARCH
THE GENUINE ARTICLE: 621EN
TITLE: Photocatalytic degradation of **chlorinated ethenes**
AUTHOR: Oki K (Reprint); Tsuchida S; Nishikiori H; Tanaka N; Fujii T
CORPORATE SOURCE: Miyama Co Ltd, 1-1-12 Tanbajima, Nagano 3812283, Japan (Reprint); Miyama Co Ltd, Nagano 3812283, Japan; Shinshu Univ, Grad Sch Sci & Technol, Matsumoto, Nagano, Japan; Shinshu Univ, Fac Engn, Dept Environm Sci & Technol, Nagano 3808553, Japan
COUNTRY OF AUTHOR: Japan
SOURCE: INTERNATIONAL JOURNAL OF PHOTOENERGY, (2003) Vol. 5, No. 1, pp. 11-15.
ISSN: 1110-662X.
PUBLISHER: PHOTOENERGY CENTER AIN SHAMS UNIV,, FAC SCIENCE, ABBASSIA, CAIRO, EGYPT.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 15
ENTRY DATE: Entered STN: 27 Dec 2002
Last Updated on STN: 27 Dec 2002
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
ED Entered STN: 27 Dec 2002
Last Updated on STN: 27 Dec 2002
AB Degradation of three **chlorinated ethenes**, trichloroethylene, trans-1,2-dichloroethylene and cis-1,2-dichloroethylene, by UV-light irradiated TiO2 catalyst prepared by the sol-gel method in dry air at ambient temperature have been examined by using FTIR measurement. The **chlorinated ethenes** rapidly decomposed to produce dichloroacethyl chloride, CO, HCl, and COCl2. For trans-and cis-1,2-DCE systems isomerization to each other is found to be the first step of the degradation. The C = C bond of the **chlorinated ethenes** interacts **directly** with TiO2 site and, consequently, the degradation results in several products on the catalyst surface in these systems.

=> file stnguide
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FILE CONTAINS CURRENT INFORMATION.
LAST RELOADED: Jul 22, 2005 (20050722/UP).

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=> d his l108

     (FILE 'HCAPLUS, MEDLINE, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, EMBASE,
     SCISEARCH, WPIX, CONF, CONFSCI' ENTERED AT 10:53:31 ON 27 JUL 2005)
L108          7 S L107 AND (CHLORINE OR CL2)

=> d que l108
L4               QUE  ABB=ON  PLU=ON  ?CHLOROETHANE OR ?CHLOROETHYLENE? OR
                  (?CHLORO(1W)(ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLEN
                 E)(1W) ?CHLORIDE)
L98           46 SEA BENJE, M?/AU
L99           38 SEA JACULI, D?/AU
L100         116 SEA MIELKE, I?/AU
L101          54 SEA SCHWARZMAIER, P?/AU
L102         159 SEA KREJCI, K?/AU
L103        3880 SEA SCHUBERT, J?/AU
L104         893 SEA ERTL, H?/AU
L105          77 SEA (L98 OR L99 OR L100 OR L101 OR L102 OR L103 OR L104) AND
                 L4
L106          45 DUP REM L105 (32 DUPLICATES REMOVED)
L107          29 SEA L106 AND (CHLORINAT? OR HALOGENAT?)
L108           7 SEA L107 AND (CHLORINE OR CL2)


=> d ibib ed ab l108 1-
YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS, WPIX' - CONTINUE? (Y)/N:y


YOU HAVE REQUESTED DATA FROM 7 ANSWERS - CONTINUE? Y/(N):y

L108 ANSWER 1 OF 7  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2003:399135  HCAPLUS
DOCUMENT NUMBER:          138:402123
TITLE:                    Direct chlorination. Newly developed process
                          steps assure economic viability and selectivity
AUTHOR(S):                Benje, Michael
CORPORATE SOURCE:         Uhde und Vinnolit, Germany
SOURCE:                   Chemie-Anlagen + Verfahren (2003), 36(4), 16
                          CODEN: CHAVBZ; ISSN: 0009-2800
PUBLISHER:                Konradin Verlag Robert Kohlhammer
DOCUMENT TYPE:            Journal
LANGUAGE:                 German
ED   Entered STN:  26 May 2003
AB   Improvements to a direct chlorination process (Vinnolit) for
     producing dichloroethane (precursor for vinyl chloride) are
     discussed, including improved entry of Cl2 and ethylene into the
     reactor and use of a special catalyst system, as well as better heat
     recovery (≤60%).

L108 ANSWER 2 OF 7  HCAPLUS  COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER:         2003:238167  HCAPLUS
DOCUMENT NUMBER:          138:256909
TITLE:                    Procedure for the production of 1,2-
                          dichloroethane by means of the direct
                          chlorination of ethylene
INVENTOR(S):              Benje, Michael; Jaculi, Dieter;
                          Mielke, Ingolf; Schwarzmaier, Peter;
                          Krejci, Klaus; Schubert, Joachim;
                          Ertl, Horst
PATENT ASSIGNEE(S):       Vinnolit Technologie G.m.b.H. & Co.K.-G. Werk Gendorf,
```

Germany; Uhde Gmbh
SOURCE: Ger., 6 pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10207217	C1	20030327	DE 2002-10207217	20020221
WO 2003070673	A1	20030828	WO 2003-EP1000	20030201
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1476411	A1	20041117	EP 2003-706408	20030201
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				

PRIORITY APPLN. INFO.: DE 2002-10207217 A 20020221
WO 2003-EP1000 W 20030201

ED Entered STN: 27 Mar 2003
AB A procedure for the production of high-purity 1,2-**dichloroethane** where ethylene and **chlorine** are supplied to the reaction medium and a **chlorine**-containing gas flow is brought into a part of the reaction medium solution which is essentially free of dissolved ethylene and the undissolved gaseous components are removed from this solution by means of a centrifugation device for gas separation from the solution A process flow diagram is presented.
REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L108 ANSWER 3 OF 7 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2002:27524 HCAPLUS
DOCUMENT NUMBER: 136:87501
TITLE: Procedure for the production of 1,2-**dichloroethane** by direct **chlorination** of ethylene with **chlorine** in the presence of a tetrahalogenated hydrocarbon
INVENTOR(S): Trautschold, Stephan; Haerter, Peter; Herrmann, Wolfgang A.; **Jaculi, Dieter**; **Mielke, Ingolf**; Stoeger, Manfred
PATENT ASSIGNEE(S): Vinnolit Technologie Gmbh & Co. Kg, Germany
SOURCE: Ger. Offen., 4 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10030681	A1	20020110	DE 2000-10030681	20000623

PRIORITY APPLN. INFO.: DE 2000-10030681 20000623

OTHER SOURCE(S): CASREACT 136:87501
ED Entered STN: 11 Jan 2002
AB A procedure for the production of 1,2-**dichloroethane** by feeding ethylene and **chlorine** into a circulating liquid phase, which consists of a quadruply **halogenated** hydrocarbon (e.g., 1,1,2,2-**tetrachloroethane**) solvent, is presented.
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L108 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2001:359939 HCAPLUS
DOCUMENT NUMBER: 134:341834
TITLE: Method and device for exploiting heat resulting from the production of 1,2-**dichloroethane** from **chlorine** and ethylene
INVENTOR(S): **Benje, Michael**; Porscha, Peter; Von Egelstein, Stefan
PATENT ASSIGNEE(S): Krupp Uhde G.m.b.H., Germany
SOURCE: PCT Int. Appl., 19 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001034542	A2	20010517	WO 2000-EP10630	20001028
WO 2001034542	A3	20011206		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
DE 19953762	A1	20010523	DE 1999-19953762	19991109
DE 19953762	C2	20030710		
EP 1228022	A2	20020807	EP 2000-974475	20001028
EP 1228022	B1	20040609		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
JP 2003513943	T2	20030415	JP 2001-536493	20001028
AT 268745	E	20040615	AT 2000-974475	20001028
NO 2002002182	A	20020507	NO 2002-2182	20020507

PRIORITY APPLN. INFO.: DE 1999-19953762 A 19991109
WO 2000-EP10630 W 20001028

ED Entered STN: 18 May 2001
AB A method and a device for extracting the reaction heat resulting from the production of 1,2-**dichloroethane** from ethene and **chlorine** are described. Extraction of the **chlorination** reaction heat from the reaction chamber occurs using at least one part of gaseous 1,2-**dichloroethane** (latent heat) and at least one part of liquid 1,2-**dichloroethane** (feelable heat) removed from the reaction chamber. The reaction heat is used to heat two fractionating columns used in purifying 1,2-**dichloroethane**; a process flow diagram is presented.

L108 ANSWER 5 OF 7 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2000:666684 HCAPLUS
DOCUMENT NUMBER: 133:237573
TITLE: Method of producing **ethylene dichloride** by catalytic **chlorination** of ethylene where the ethylene or **chlorine** gas is introduced into the reaction medium by means of microporous gas diffuser elements producing gas bubbles of 0.3-3-millimeter diameter
INVENTOR(S): **Benje, Michael**
PATENT ASSIGNEE(S): Krupp Uhde G.m.b.H., Germany
SOURCE: PCT Int. Appl., 45 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000055107	A1	20000921	WO 1999-EP7649	19991012
W: AL, AM, AU, AZ, BA, BB, BG, BR, BY, CA, CN, CU, CZ, EE, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
DE 19910964	A1	20000921	DE 1999-19910964	19990312
AU 9964705	A1	20001004	AU 1999-64705	19991012
EP 1161406	A1	20011212	EP 1999-952553	19991012
EP 1161406	B1	20040421		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002539179	T2	20021119	JP 2000-605538	19991012
AT 264827	E	20040515	AT 1999-952553	19991012
PT 1161406	T	20040831	PT 1999-952553	19991012
ES 2217824	T3	20041101	ES 1999-952553	19991012
NO 2001004198	A	20010829	NO 2001-4198	20010829
US 6841708	B1	20050111	US 2001-936335	20010912
US 2005049444	A1	20050303	US 2004-961316	20041008

PRIORITY APPLN. INFO.:
DE 1999-19910964 A 19990312
WO 1999-EP7649 W 19991012
US 2001-936335 A3 20010912

OTHER SOURCE(S): CASREACT 133:237573
ED Entered STN: 22 Sep 2000
AB 1,2-**Dichloroethane** is prepared in high yield and selectivity by using a circulating reaction medium and a catalyst (e.g., FeCl3) where the catalytic **chlorination** of the ethylene in a manner that is especially gentle for the product. The ethylene or **chlorine** gas is introduced into the reaction medium by means of microporous gas diffuser elements in order to produce gas bubbles with a diameter of 0.3-3 mm.
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L108 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 1996:237464 HCAPLUS
DOCUMENT NUMBER: 124:288752
TITLE: Preparation of 1,2-dichlorethane by direct

chlorination of ethylene.
INVENTOR(S): Eichler, Juergen; **Mielke, Ingolf**; **Schwarzmaier, peter**; Stoeger, Manfred; Wild, Thomas
PATENT ASSIGNEE(S): Hoechst A.-G., Germany
SOURCE: Ger. Offen., 4 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 4425872	A1	19960125	DE 1994-4425872	19940721
CA 2195558	AA	19960208	CA 1995-2195558	19950715
WO 9603361	A1	19960208	WO 1995-EP2787	19950715
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AU 9531118	A1	19960222	AU 1995-31118	19950715
AU 693583	B2	19980702		
EP 772576	A1	19970514	EP 1995-926901	19950715
EP 772576	B1	19990120		
R: BE, DE, ES, FR, GB, GR, IT, NL, SE				
CN 1152903	A	19970625	CN 1995-194121	19950715
BR 9508311	A	19971223	BR 1995-8311	19950715
HU 77001	A2	19980128	HU 1997-155	19950715
JP 10502932	T2	19980317	JP 1995-505420	19950715
ZA 9506058	A	19960227	ZA 1995-6058	19950720
FI 9700216	A	19970117	FI 1997-216	19970117
NO 9700237	A	19970120	NO 1997-237	19970120

PRIORITY APPLN. INFO.: DE 1994-4425872 A 19940721
WO 1995-EP2787 W 19950715

ED Entered STN: 23 Apr 1996
AB 1,2-**Dichloroethane** (I) was prepared by reaction of ethylene and **Cl2** in a stream of I using a catalyst comprising FeCl3, a halide of a metal of the first or second main groups of the periodic table (e.g., NaCl), and traces of O2. Part of the reaction stream is flash vaporized and I is separated from more volatile components, which are returned to the reaction stream. The process yielded I of 99.92% purity.

L108 ANSWER 7 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
ACCESSION NUMBER: 2000-612503 [59] WPIX
DOC. NO. CPI: C2000-183438
TITLE: Catalytic production of 1,2-dichloromethane from ethylene and **chlorine** in circulating medium has ethylene feed in up-flow zone, mixer before **chlorine** feed in down-flow zone and evaporator using heat of reaction.
DERWENT CLASS: E16
INVENTOR(S): **BENJE, M**
PATENT ASSIGNEE(S): (KRPP) KRUPP UHDE GMBH; (UHDE) UHDE GMBH; (VINN-N) VINNOLIT TECHNOLOGIE GMBH & CO KG
COUNTRY COUNT: 87
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
DE 19910964	A1	20000921	(200059)*		7
WO 2000055107	A1	20000921	(200059)	GE	
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW					
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AU 9964705	A	20001004	(200101)		
NO 2001004198	A	20010829	(200171)		
EP 1161406	A1	20011212	(200204)	GE	
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI					
JP 2002539179	W	20021119	(200281)		23
EP 1161406	B1	20040421	(200428)	GE	
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DE 59909268	G	20040527	(200436)		
ES 2217824	T3	20041101	(200474)		
US 6841708	B1	20050111	(200505)		
US 2005049444	A1	20050303	(200517)		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
DE 19910964	A1	DE 1999-1010964	19990312
WO 2000055107	A1	WO 1999-EP7649	19991012
AU 9964705	A	AU 1999-64705	19991012
NO 2001004198	A	WO 1999-EP7649	19991012
		NO 2001-4198	20010829
EP 1161406	A1	EP 1999-952553	19991012
		WO 1999-EP7649	19991012
JP 2002539179	W	WO 1999-EP7649	19991012
		JP 2000-605538	19991012
EP 1161406	B1	EP 1999-952553	19991012
		WO 1999-EP7649	19991012
DE 59909268	G	DE 1999-509268	19991012
		EP 1999-952553	19991012
		WO 1999-EP7649	19991012
ES 2217824	T3	EP 1999-952553	19991012
US 6841708	B1	WO 1999-EP7649	19991012
		US 2001-936335	20010912
US 2005049444	A1 Div ex	WO 1999-EP7649	19991012
	Div ex	US 2001-936335	20010912
		US 2004-961316	20041008

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 9964705	A	Based on	WO 2000055107
EP 1161406	A1	Based on	WO 2000055107
JP 2002539179	W	Based on	WO 2000055107
EP 1161406	B1	Based on	WO 2000055107
DE 59909268	G	Based on	EP 1161406
		Based on	WO 2000055107
ES 2217824	T3	Based on	EP 1161406
US 6841708	B1	Based on	WO 2000055107
US 2005049444	A1	Div ex	US 6841708

PRIORITY APPLN. INFO: DE 1999-19910964 19990312
ED 20001117
AB DE 19910964 A UPAB: 20031223
NOVELTY - 1,2-dichloromethane is produced from ethylene and **chlorine** in circulating medium having ethylene feed in up-flow zone, mixer before **chlorine** feed in down-flow zone and evaporator using heat of reaction.
DETAILED DESCRIPTION - In the production of 1,2-**dichloroethane** (EDC) by passing ethylene (C2H4) and **chlorine** (**Cl2**) into a circulating reaction medium and catalyst, C2H4 is introduced at a point where the medium flows up and **Cl2** at a point where it flows down after passing through a mixing and dissolving zone. EDC vaporized by the heat of reaction is discharged as vapor, whilst the residue in the evaporator is recycled to the reaction zone. An INDEPENDENT CLAIM is also included for the plant used in this process.
USE - For producing 1,2-dichloromethane.
ADVANTAGE - An existing system for mass production of EDC uses a very large circulating stream and required large, high-power pumps, which makes the capital and operating costs high. Another uses the gas-lift effect of the gaseous reactants or natural convection for circulation but usually requires a **Cl2** precompressor. Both systems can result in a local excess of **Cl2** and the formation of more highly **chlorinated** by-products. The present process uses the heat of reaction and minimizes the formation of more highly **chlorinated** products, e.g. tri-, tetra- and penta-**chloroethane** and plant based on a modular, cost-effective system.
DESCRIPTION OF DRAWING(S) - The drawing shows a simplified version of the plant.
Plant 1
Evaporator 2
Vapor dome 3
Fall pipe 4
Transfer pipe 5, 5a
Riser 6, 6a
Divider in evaporator for modular construction 7
Flow direction 8
Flow straighteners 9, 13
Microporous gas distributors 10
Ethylene feed pipe 11
Dissolution zone 12
Feed for **chlorine** dissolved in reaction medium 14
Feed pipe for mixture of reaction medium and **chlorine** 15
By-pass pipe 16
Pump 17
Heat exchanger 18
Compressor 19
Pipes 20, 24
Static mixer 21
Throttle valve 22
Ultrasonic flow meter 23
Distributor 25
Dwg.1/2

=> file stnguide
FILE 'STNGUIDE' ENTERED AT 11:07:21 ON 27 JUL 2005
USE IS SUBJECT TO THE TERMS OF YOUR CUSTOMER AGREEMENT
COPYRIGHT (C) 2005 AMERICAN CHEMICAL SOCIETY, JAPAN SCIENCE

AND TECHNOLOGY CORPORATION, AND FACHINFORMATIONSZENTRUM KARLSRUHE

FILE CONTAINS CURRENT INFORMATION.
LAST RELOADED: Jul 22, 2005 (20050722/UP).

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L10             965 SEA FILE=HCAPLUS ABB=ON  PLU=ON  107-06-2P?
L11             965 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L9 (L) (PREP+NT)/RL
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L17             321 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 AND L16
L19          280481 SEA FILE=HCAPLUS ABB=ON  PLU=ON  REACTORS+PFT,NT/CT
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                NT/CT
L21            2508 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "CYCLONE SEPARATORS"+PFT,NT/CT

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L32           10938 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 (L) REACTION?
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L49             565 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (L46 OR L47 OR L48) AND (L16
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                "TWO-STAGE" OR ELECTROLYTICALLY OR ELASTOMERS)/TI
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L15          4330 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10 OR L11 OR (L13 OR L14)
L16         18990 SEA FILE=HCAPLUS ABB=ON  PLU=ON  CHLORINATION/CT
L17           321 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L15 AND L16
L19        280481 SEA FILE=HCAPLUS ABB=ON  PLU=ON  REACTORS+PFT,NT/CT
L20          2154 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "SEPARATORS (L) CYCLONES"+PFT,
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L21          2508 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "CYCLONE SEPARATORS"+PFT,NT/CT

L22            24 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 AND (L19 OR L20 OR L21)
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L30          5786 SEA FILE=HCAPLUS ABB=ON  PLU=ON  "CHLORINE, REACTIONS"/OBI
L32         10938 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L23 (L) REACTION?
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L38             1 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L34 AND L37
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L45         25129 SEA FILE=HCAPLUS ABB=ON  PLU=ON  (?CHLOROALKANE/OBI OR
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                BI OR ETHANE/OBI OR ETHYLENE/OBI))) OR ((ALKANE/OBI OR
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L46           915 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L45 (L) (PREP+NT)/RL
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L63        1506 SEA CHLORINATION/CT
L66          25 SEA L60 AND L63
L67          19 SEA L66 NOT (OXYHALOGENATION OR ETHYLENEOXICHLORINATION OR
                SULPHONIC OR EFFLUENT)/TI
L68          18 SEA L67 AND (AY<2003 OR PY<2003 OR PRY<2003)
L69           1 SEA L67 NOT L68


=> d que l77
L70         193 SEA FILE=WPIX ABB=ON  PLU=ON  C07C019-045?/IPC
L71         456 SEA FILE=WPIX ABB=ON  PLU=ON  C07C017-02/IPC
L72         344 SEA FILE=WPIX ABB=ON  PLU=ON  E10-H03C4/MC
L73          70 SEA FILE=WPIX ABB=ON  PLU=ON  L70 AND L71
L74          42 SEA FILE=WPIX ABB=ON  PLU=ON  L73 AND L72
L75          15 SEA FILE=WPIX ABB=ON  PLU=ON  L74 AND (?CENTRIFUG?/BIX OR
                ?CENTRIPET?/BIX OR ?CYCLON?/BIX OR ?CIRCULAT?/BIX)
L76          13 SEA FILE=WPIX ABB=ON  PLU=ON  L75 NOT (OXYCHLORINAT?)/TI
L77          13 SEA FILE=WPIX ABB=ON  PLU=ON  L76 AND (AY<2003 OR PY<2003 OR
                PRY<2003)


=> d his l96

     (FILE 'BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' ENTERED AT
     10:41:28 ON 27 JUL 2005)
L96          18 S L95 AND (AY<2003 OR PY<2003 OR PRY<2003 OR MY<2003)

=> d que l96
L4              QUE  ABB=ON  PLU=ON  ?CHLOROETHANE OR ?CHLOROETHYLENE? OR
                 (?CHLORO(1W)(ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLEN
                E)(1W) ?CHLORIDE)
L7              QUE  ABB=ON  PLU=ON  ?CENTRIFUG? OR ?CENTRIPET? OR ?CYCLO
                N? OR ?CIRCULAT?
L12             QUE  ABB=ON  PLU=ON  ?PREP? OR ?SYNTH? OR ?PRODUC? OR FOR
                M? OR YIELD?
L79        28045 SEA L4
L80         1871 SEA L79 (5A) L12
L82        92223 SEA CHLORINAT? OR HALOGENAT?
L84          388 SEA L80 AND L82
L85           13 SEA L84 AND L7
L86            3 SEA L85 AND CHLORINATION/TI
L88         2393 SEA L82 (5A) (ETHANE OR ETHYLENE OR ETHENE)
L89           29 SEA L88 AND L7
L90          456 SEA L82 (3A) DIRECT?
L91           26 SEA L88 AND L90
L92           52 SEA L89 OR L91
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L93           52 SEA L86 OR L92
L94           37 DUP REM L93 (15 DUPLICATES REMOVED)
L95           21 SEA L94 NOT (GROUNDWATER OR MARROW OR ALLOY OR SERUM OR
                 ENZYMES OR SCLERODERMA OR COMETABOLIC OR B12 OR BLOOD OR
                 AEROBIC OR ANAEROBIC OR RAT OR FISH OR TOXICANTS)/TI
L96           18 SEA L95 AND (AY<2003 OR PY<2003 OR PRY<2003 OR MY<2003)


=> d his l97

     (FILE 'BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' ENTERED AT
     10:41:28 ON 27 JUL 2005)
L97            3 S L95 NOT L96

=> d que l97
L4               QUE  ABB=ON  PLU=ON  ?CHLOROETHANE OR ?CHLOROETHYLENE? OR
                  (?CHLORO(1W)(ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLEN
                 E)(1W) ?CHLORIDE)
L7               QUE  ABB=ON  PLU=ON  ?CENTRIFUG? OR ?CENTRIPET? OR ?CYCLO
                 N? OR ?CIRCULAT?
L12              QUE  ABB=ON  PLU=ON  ?PREP? OR ?SYNTH? OR ?PRODUC? OR FOR
                 M? OR YIELD?
L79        28045 SEA L4
L80         1871 SEA L79 (5A) L12
L82        92223 SEA CHLORINAT? OR HALOGENAT?
L84          388 SEA L80 AND L82
L85           13 SEA L84 AND L7
L86            3 SEA L85 AND CHLORINATION/TI
L88         2393 SEA L82 (5A) (ETHANE OR ETHYLENE OR ETHENE)
L89           29 SEA L88 AND L7
L90          456 SEA L82 (3A) DIRECT?
L91           26 SEA L88 AND L90
L92           52 SEA L89 OR L91
L93           52 SEA L86 OR L92
L94           37 DUP REM L93 (15 DUPLICATES REMOVED)
L95           21 SEA L94 NOT (GROUNDWATER OR MARROW OR ALLOY OR SERUM OR
                 ENZYMES OR SCLERODERMA OR COMETABOLIC OR B12 OR BLOOD OR
                 AEROBIC OR ANAEROBIC OR RAT OR FISH OR TOXICANTS)/TI
L96           18 SEA L95 AND (AY<2003 OR PY<2003 OR PRY<2003 OR MY<2003)
L97            3 SEA L95 NOT L96


=> d his l108

     (FILE 'HCAPLUS, MEDLINE, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, EMBASE,
     SCISEARCH, WPIX, CONF, CONFSCI' ENTERED AT 10:53:31 ON 27 JUL 2005)
L108           7 S L107 AND (CHLORINE OR CL2)

=> d que l108
L4               QUE  ABB=ON  PLU=ON  ?CHLOROETHANE OR ?CHLOROETHYLENE? OR
                  (?CHLORO(1W)(ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLEN
                 E)(1W) ?CHLORIDE)
L98           46 SEA BENJE, M?/AU
L99           38 SEA JACULI, D?/AU
L100         116 SEA MIELKE, I?/AU
L101          54 SEA SCHWARZMAIER, P?/AU
L102         159 SEA KREJCI, K?/AU
L103        3880 SEA SCHUBERT, J?/AU
L104         893 SEA ERTL, H?/AU
L105          77 SEA (L98 OR L99 OR L100 OR L101 OR L102 OR L103 OR L104) AND
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                L4
L106           45 DUP REM L105 (32 DUPLICATES REMOVED)
L107           29 SEA L106 AND (CHLORINAT? OR HALOGENAT?)
L108            7 SEA L107 AND (CHLORINE OR CL2)


=> d his ful

     (FILE 'HOME' ENTERED AT 08:35:19 ON 27 JUL 2005)

     FILE 'ZCAPLUS' ENTERED AT 08:35:27 ON 27 JUL 2005
                E WO 2003-EP1000/APPS
                E WO2003-EP1000/APPS

     FILE 'HCAPLUS' ENTERED AT 08:36:10 ON 27 JUL 2005
L1              1 SEA ABB=ON  PLU=ON  WO2003-EP1000/APPS
                SAVE TEMP L1 NYA245HCAAPP/A
                D IALL

     FILE 'STNGUIDE' ENTERED AT 08:36:36 ON 27 JUL 2005

     FILE 'WPIX' ENTERED AT 08:39:47 ON 27 JUL 2005
L2              1 SEA ABB=ON  PLU=ON  WO2003-EP1000/APPS
                SAVE TEMP L2 NYA245WPIAPP/A
                D IALL

     FILE 'STNGUIDE' ENTERED AT 08:40:17 ON 27 JUL 2005
                D SAVED

     FILE 'HCAPLUS' ENTERED AT 09:04:50 ON 27 JUL 2005
L3              QUE ABB=ON  PLU=ON  ETHANE OR ETHYLENE
L4              QUE ABB=ON  PLU=ON  ?CHLOROETHANE OR ?CHLOROETHYLENE? OR
                (?CHLORO(1W)(ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLENE)(1W)
                ?CHLORIDE)
L5              QUE ABB=ON  PLU=ON  ?HALOETHANE OR ?HALOETHYLENE? OR (?HALO(1W)
                (ETHANE OR ETHYLENE)) OR ((ETHANE OR ETHYLENE)(1W)?HALIDE)
L6              QUE ABB=ON  PLU=ON  CL2 OR CHLORINE OR CHLORINAT? OR ?CHLORID?

L7              QUE ABB=ON  PLU=ON  ?CENTRIFUG? OR ?CENTRIPET? OR ?CYCLON? OR
                ?CIRCULAT?

     FILE 'STNGUIDE' ENTERED AT 09:06:13 ON 27 JUL 2005

     FILE 'REGISTRY' ENTERED AT 09:06:30 ON 27 JUL 2005
L8              1 SEA ABB=ON  PLU=ON  107-06-2/RN
                D SCAN
                SAVE TEMP L8 NYA245REGCL/A

     FILE 'HCAPLUS' ENTERED AT 09:07:16 ON 27 JUL 2005
L9          13833 SEA ABB=ON  PLU=ON  L8
L10           965 SEA ABB=ON  PLU=ON  107-06-2P?
L11           965 SEA ABB=ON  PLU=ON  L9 (L) (PREP+NT)/RL
L12             QUE ABB=ON  PLU=ON  ?PREP? OR ?SYNTH? OR ?PRODUC? OR FORM? OR
                YIELD?
L13          2587 SEA ABB=ON  PLU=ON  L9(L) L12
L14          1723 SEA ABB=ON  PLU=ON  L8 (L) (PROC+NT)/RL
L15          4330 SEA ABB=ON  PLU=ON  L10 OR L11 OR (L13 OR L14)

     FILE 'ZCAPLUS' ENTERED AT 09:10:12 ON 27 JUL 2005
                E CHLORINATION/CT
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                E E27+ALL
                E CYCLONE SEPARATORS/CT
                E E54+ALL

     FILE 'HCAPLUS' ENTERED AT 09:11:49 ON 27 JUL 2005
L16         18990 SEA ABB=ON  PLU=ON  CHLORINATION/CT
L17           321 SEA ABB=ON  PLU=ON  L15 AND L16

     FILE 'ZCAPLUS' ENTERED AT 09:12:09 ON 27 JUL 2005
                E REACTORS/CT

     FILE 'HCAPLUS' ENTERED AT 09:12:21 ON 27 JUL 2005
L18          1040 SEA ABB=ON  PLU=ON  L15 (L) L6
L19        280481 SEA ABB=ON  PLU=ON  REACTORS+PFT,NT/CT
L20          2154 SEA ABB=ON  PLU=ON  "SEPARATORS (L) CYCLONES"+PFT,NT/CT
L21          2508 SEA ABB=ON  PLU=ON  "CYCLONE SEPARATORS"+PFT,NT/CT
L22            24 SEA ABB=ON  PLU=ON  L17 AND (L19 OR L20 OR L21)

     FILE 'STNGUIDE' ENTERED AT 09:15:10 ON 27 JUL 2005

     FILE 'REGISTRY' ENTERED AT 09:15:24 ON 27 JUL 2005
L23             1 SEA ABB=ON  PLU=ON  7782-50-5/RN
                D SCAN
                SAVE TEMP L23 NYA245REGCL2/A

     FILE 'HCAPLUS' ENTERED AT 09:16:14 ON 27 JUL 2005

     FILE 'ZCAPLUS' ENTERED AT 09:16:27 ON 27 JUL 2005
                E CHLORINE/CT
                E E86+ALL
                E CHLORINE, REACTIONS/CT

     FILE 'HCAPLUS' ENTERED AT 09:17:14 ON 27 JUL 2005
L24          3693 SEA ABB=ON  PLU=ON  CHLORINE (L) REACT?/CW
L25          2100 SEA ABB=ON  PLU=ON  CHLORINE (3A) REACT?/CW
L26          1703 SEA ABB=ON  PLU=ON  CHLORINE (2A) REACT?/CW
L27             0 SEA ABB=ON  PLU=ON  CHLORINE (1W) REACT?/CW
L28             0 SEA ABB=ON  PLU=ON  "CHLORINE, REACTIONS"/CW
L29             0 SEA ABB=ON  PLU=ON  "CHLORINE, REACTIONS"/CT
L30          5786 SEA ABB=ON  PLU=ON  "CHLORINE, REACTIONS"/OBI
L31            57 SEA ABB=ON  PLU=ON  L15 AND L30
L32         10938 SEA ABB=ON  PLU=ON  L23 (L) REACTION?
L33         10216 SEA ABB=ON  PLU=ON  L23 (L) (RACT+NT)/RL

     FILE 'STNGUIDE' ENTERED AT 09:21:07 ON 27 JUL 2005

     FILE 'HCAPLUS' ENTERED AT 09:22:22 ON 27 JUL 2005
L34            80 SEA ABB=ON  PLU=ON  L15 AND (L30 OR L32 OR L33)
L35             8 SEA ABB=ON  PLU=ON  L34 AND L19
L36             1 SEA ABB=ON  PLU=ON  L34 AND (L20 OR L21)
L37            23 SEA ABB=ON  PLU=ON  (L30 OR L32 OR L33)(L)L7
L38             1 SEA ABB=ON  PLU=ON  L34 AND L37
L39             8 SEA ABB=ON  PLU=ON  (L35 OR L36) OR L38
                D SCAN

     FILE 'STNGUIDE' ENTERED AT 09:24:33 ON 27 JUL 2005

     FILE 'HCAPLUS' ENTERED AT 09:30:00 ON 27 JUL 2005
L40             QUE ABB=ON  PLU=ON  ALKANE OR ALKYLENE OR PARAFFIN
L41             QUE ABB=ON  PLU=ON  ?CHLOROALKANE OR ?CHLOROALKYLENE OR
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                ?CHLOROPARAFFIN OR ((?CHLORO OR ?CHLORINAT?) (2A) (ALKANE OR
                ALKYLENE OR PARAFFIN OR ETHANE OR ETHYLENE))
L42             QUE ABB=ON  PLU=ON  (ALKANE OR ALKYLENE OR PARAFFIN)(1W)
                ?CHLORIDE
L43             QUE ABB=ON  PLU=ON  (ALKANE OR ALKYLENE OR PARAFFIN)(1W)
                ?HALIDE
L44             QUE ABB=ON  PLU=ON  ?HALOALKANE OR ?HALOALKYLENE OR ?HALOPARAFF
                IN OR ((?HALO OR ?HALOGENAT?)(2A)(ALKANE OR ALKYLENE OR
                PARAFFIN OR ETHANE OR ETHYLENE))

     FILE 'STNGUIDE' ENTERED AT 09:31:00 ON 27 JUL 2005

     FILE 'HCAPLUS' ENTERED AT 09:32:36 ON 27 JUL 2005
                D SCAN TI HIT L22

     FILE 'STNGUIDE' ENTERED AT 09:33:06 ON 27 JUL 2005

     FILE 'HCAPLUS' ENTERED AT 09:35:32 ON 27 JUL 2005
L45         25129 SEA ABB=ON  PLU=ON  (?CHLOROALKANE/OBI OR ?CHLOROALKYLENE/OBI
                OR ?CHLOROPARAFFIN/OBI OR ((?CHLORO/OBI OR ?CHLORINAT?/OBI)
                (2A) (ALKANE/OBI OR ALKYLENE/OBI OR PARAFFIN/OBI OR ETHANE/OBI
                OR ETHYLENE/OBI))) OR ((ALKANE/OBI OR ALKYLENE/OBI OR PARAFFIN/
                OBI)(1W) ?CHLORIDE/OBI)
L46           915 SEA ABB=ON  PLU=ON  L45 (L) (PREP+NT)/RL
L47           563 SEA ABB=ON  PLU=ON  L45 (L) (PROC+NT)/RL
L48          3578 SEA ABB=ON  PLU=ON  L45 (L) L12
                D QUE L22
L49           565 SEA ABB=ON  PLU=ON  (L46 OR L47 OR L48) AND (L16 OR L30 OR L32
                OR L33)
L50            29 SEA ABB=ON  PLU=ON  L49 AND L19
L51             1 SEA ABB=ON  PLU=ON  L49 AND ((L20 OR L21))
L52             4 SEA ABB=ON  PLU=ON  L49 AND (L45 (L) L7)
L53            30 SEA ABB=ON  PLU=ON  (L50 OR L51 OR L52)
L54            40 SEA ABB=ON  PLU=ON  L39 OR L22 OR L53
                D SCAN TI HIT

     FILE 'STNGUIDE' ENTERED AT 09:39:36 ON 27 JUL 2005

     FILE 'HCAPLUS' ENTERED AT 09:45:47 ON 27 JUL 2005
L55            23 SEA ABB=ON  PLU=ON  L54 NOT (ELECTROCHEMICAL OR "ELECTRO-ORGANI
                C" OR OXYCHLORINATION OR HYDROXYCHLORINATION OR "TWO-STAGE" OR
                ELECTROLYTICALLY OR ELASTOMERS)/TI

     FILE 'STNGUIDE' ENTERED AT 09:46:02 ON 27 JUL 2005

     FILE 'HCAPLUS' ENTERED AT 09:46:20 ON 27 JUL 2005
L56            20 SEA ABB=ON  PLU=ON  L55 AND (AY<2003 OR PY<2003 OR PRY<2003)
                SAVE TEMP L56 NYA245HCA1B/A
L57             3 SEA ABB=ON  PLU=ON  L55 NOT L56
                SAVE TEMP L57 NYA245HCA1A/A

     FILE 'STNGUIDE' ENTERED AT 09:47:25 ON 27 JUL 2005
                D SAVED

     FILE 'USPATFULL, USPAT2' ENTERED AT 09:48:35 ON 27 JUL 2005
L58          1276 SEA ABB=ON  PLU=ON  L8
L59          7316 SEA ABB=ON  PLU=ON  L23
L60            59 SEA ABB=ON  PLU=ON  L58 AND L59
L61          5338 SEA ABB=ON  PLU=ON  REACTORS/CT
L62             5 SEA ABB=ON  PLU=ON  L60 AND L61
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                D SCAN
L63          1506 SEA ABB=ON  PLU=ON  CHLORINATION/CT
L64             0 SEA ABB=ON  PLU=ON  L63 (L) DIRECT
L65             5 SEA ABB=ON  PLU=ON  L60 AND L62
L66            25 SEA ABB=ON  PLU=ON  L60 AND L63
                D SCAN TI HIT
                D SCAN

     FILE 'STNGUIDE' ENTERED AT 09:51:26 ON 27 JUL 2005

     FILE 'USPATFULL, USPAT2' ENTERED AT 09:54:47 ON 27 JUL 2005
L67            19 SEA ABB=ON  PLU=ON  L66 NOT (OXYHALOGENATION OR ETHYLENEOXICHLO
                  RINATION OR SULPHONIC OR EFFLUENT)/TI
L68            18 SEA ABB=ON  PLU=ON  L67 AND (AY<2003 OR PY<2003 OR PRY<2003)
                  SAVE TEMP L68 NYA245USP1B/A
L69             1 SEA ABB=ON  PLU=ON  L67 NOT L68
                  SAVE TEMP L69 NYA245USP1A/A

     FILE 'STNGUIDE' ENTERED AT 09:56:04 ON 27 JUL 2005
                D SAVED

     FILE 'WPIX' ENTERED AT 09:56:57 ON 27 JUL 2005
L70           193 SEA ABB=ON  PLU=ON  C07C019-045?/IPC
L71           456 SEA ABB=ON  PLU=ON  C07C017-02/IPC
                E N04-D01/MC
                E E118+ALL
                E N04-D09/MC
                E N07-D09/MC
                E E145+ALL

     FILE 'STNGUIDE' ENTERED AT 09:59:02 ON 27 JUL 2005

     FILE 'WPIX' ENTERED AT 09:59:24 ON 27 JUL 2005
L72           344 SEA ABB=ON  PLU=ON  E10-H03C4/MC
L73            70 SEA ABB=ON  PLU=ON  L70 AND L71
L74            42 SEA ABB=ON  PLU=ON  L73 AND L72
                D TRI 1-3
L75            15 SEA ABB=ON  PLU=ON  L74 AND (?CENTRIFUG?/BIX OR ?CENTRIPET?/BIX
                   OR ?CYCLON?/BIX OR ?CIRCULAT?/BIX)
                D TRI 1-15

     FILE 'STNGUIDE' ENTERED AT 10:01:23 ON 27 JUL 2005

     FILE 'WPIX' ENTERED AT 10:04:02 ON 27 JUL 2005
L76            13 SEA ABB=ON  PLU=ON  L75 NOT (OXYCHLORINAT?)/TI
L77            13 SEA ABB=ON  PLU=ON  L76 AND (AY<2003 OR PY<2003 OR PRY<2003)
                  SAVE TEMP L77 NYA245WPI1B/A
L78             0 SEA ABB=ON  PLU=ON  L76 NOT L77

     FILE 'STNGUIDE' ENTERED AT 10:21:45 ON 27 JUL 2005
                D SAVED

     FILE 'BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' ENTERED AT
     10:24:04 ON 27 JUL 2005
L79         28045 SEA ABB=ON  PLU=ON  L4
L80          1871 SEA ABB=ON  PLU=ON  L79 (5A) L12
L81            60 SEA ABB=ON  PLU=ON  L80 AND L7
L82         92223 SEA ABB=ON  PLU=ON  CHLORINAT? OR HALOGENAT?
L83            13 SEA ABB=ON  PLU=ON  L81 AND L82
L84           388 SEA ABB=ON  PLU=ON  L80 AND L82
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L85          13 SEA ABB=ON  PLU=ON  L84 AND L7
                D SCAN
L86           3 SEA ABB=ON  PLU=ON  L85 AND CHLORINATION/TI
L87       17187 SEA ABB=ON  PLU=ON  L82 (5A) (ETHANE OR ETHYLENE OR ETHENE OR
                ALKANE OR ALKENE OR ALKYLENE OR HYDROCARBON OR PARAFFIN)
L88        2393 SEA ABB=ON  PLU=ON  L82 (5A) (ETHANE OR ETHYLENE OR ETHENE)
L89          29 SEA ABB=ON  PLU=ON  L88 AND L7
L90         456 SEA ABB=ON  PLU=ON  L82 (3A) DIRECT?
L91          26 SEA ABB=ON  PLU=ON  L88 AND L90
L92          52 SEA ABB=ON  PLU=ON  L89 OR L91
L93          52 SEA ABB=ON  PLU=ON  L86 OR L92
L94          37 DUP REM L93 (15 DUPLICATES REMOVED)
                     ANSWERS '1-13' FROM FILE BIOSIS
                     ANSWERS '14-20' FROM FILE PASCAL
                     ANSWERS '21-22' FROM FILE JICST-EPLUS
                     ANSWERS '23-32' FROM FILE COMPENDEX
                     ANSWERS '33-37' FROM FILE SCISEARCH
                D SCAN

     FILE 'STNGUIDE' ENTERED AT 10:36:40 ON 27 JUL 2005

     FILE 'BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, SCISEARCH' ENTERED AT
     10:41:28 ON 27 JUL 2005
L95          21 SEA ABB=ON  PLU=ON  L94 NOT (GROUNDWATER OR MARROW OR ALLOY OR
                SERUM OR ENZYMES OR SCLERODERMA OR COMETABOLIC OR B12 OR BLOOD
                OR AEROBIC OR ANAEROBIC OR RAT OR FISH OR TOXICANTS)/TI
                D QUE
L96          18 SEA ABB=ON  PLU=ON  L95 AND (AY<2003 OR PY<2003 OR PRY<2003 OR
                MY<2003)
                SAVE TEMP L96 NYA245MUL1B/A
L97           3 SEA ABB=ON  PLU=ON  L95 NOT L96
                SAVE TEMP L97 NYA245MUL1A/A
                D SAVED

     FILE 'STNGUIDE' ENTERED AT 10:51:07 ON 27 JUL 2005

     FILE 'HCAPLUS, MEDLINE, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX, EMBASE,
     SCISEARCH, WPIX, CONF, CONFSCI' ENTERED AT 10:53:31 ON 27 JUL 2005
L98          46 SEA ABB=ON  PLU=ON  BENJE, M?/AU
L99          38 SEA ABB=ON  PLU=ON  JACULI, D?/AU
L100        116 SEA ABB=ON  PLU=ON  MIELKE, I?/AU
L101         54 SEA ABB=ON  PLU=ON  SCHWARZMAIER, P?/AU
L102        159 SEA ABB=ON  PLU=ON  KREJCI, K?/AU
L103       3880 SEA ABB=ON  PLU=ON  SCHUBERT, J?/AU
L104        893 SEA ABB=ON  PLU=ON  ERTL, H?/AU
L105         77 SEA ABB=ON  PLU=ON  (L98 OR L99 OR L100 OR L101 OR L102 OR
                L103 OR L104) AND L4
                D QUE
L106         45 DUP REM L105 (32 DUPLICATES REMOVED)
                     ANSWERS '1-42' FROM FILE HCAPLUS
                     ANSWER '43' FROM FILE MEDLINE
                     ANSWERS '44-45' FROM FILE WPIX
L107         29 SEA ABB=ON  PLU=ON  L106 AND (CHLORINAT? OR HALOGENAT?)
L108          7 SEA ABB=ON  PLU=ON  L107 AND (CHLORINE OR CL2)
                D SCAN
                SAVE TEMP L108 NYA245MULINV/A
                D SAVED

     FILE 'STNGUIDE' ENTERED AT 10:58:55 ON 27 JUL 2005
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FILE 'REGISTRY' ENTERED AT 10:59:19 ON 27 JUL 2005

FILE 'USPATFULL' ENTERED AT 10:59:23 ON 27 JUL 2005

FILE 'USPAT2' ENTERED AT 10:59:27 ON 27 JUL 2005

FILE 'ZCAPLUS' ENTERED AT 10:59:31 ON 27 JUL 2005

FILE 'HCAPLUS' ENTERED AT 10:59:34 ON 27 JUL 2005

FILE 'MEDLINE' ENTERED AT 10:59:37 ON 27 JUL 2005

FILE 'BIOSIS' ENTERED AT 10:59:41 ON 27 JUL 2005

FILE 'PASCAL' ENTERED AT 10:59:44 ON 27 JUL 2005

FILE 'JICST-EPLUS' ENTERED AT 10:59:49 ON 27 JUL 2005

FILE 'COMPENDEX' ENTERED AT 10:59:54 ON 27 JUL 2005

FILE 'EMBASE' ENTERED AT 11:00:00 ON 27 JUL 2005

FILE 'SCISEARCH' ENTERED AT 11:00:05 ON 27 JUL 2005

FILE 'WPIX' ENTERED AT 11:00:08 ON 27 JUL 2005

FILE 'CONF' ENTERED AT 11:00:12 ON 27 JUL 2005

FILE 'CONFSCI' ENTERED AT 11:00:16 ON 27 JUL 2005

FILE 'STNGUIDE' ENTERED AT 11:00:19 ON 27 JUL 2005
           D QUE L56
           D QUE L68
           D QUE L77
           D QUE L96

FILE 'HCAPLUS, USPATFULL, USPAT2, WPIX, BIOSIS, PASCAL, JICST-EPLUS,
COMPENDEX, SCISEARCH' ENTERED AT 11:01:16 ON 27 JUL 2005
L109         64 DUP REM L56 L68 L77 L96 (5 DUPLICATES REMOVED)
                ANSWERS '1-20' FROM FILE HCAPLUS
                ANSWERS '21-37' FROM FILE USPATFULL
                ANSWERS '38-47' FROM FILE WPIX
                ANSWER '48' FROM FILE BIOSIS
                ANSWERS '49-54' FROM FILE PASCAL
                ANSWER '55' FROM FILE JICST-EPLUS
                ANSWERS '56-62' FROM FILE COMPENDEX
                ANSWERS '63-64' FROM FILE SCISEARCH

FILE 'STNGUIDE' ENTERED AT 11:01:56 ON 27 JUL 2005

FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX,
SCISEARCH' ENTERED AT 11:02:05 ON 27 JUL 2005
           D IBIB ED AB HITIND

FILE 'STNGUIDE' ENTERED AT 11:02:07 ON 27 JUL 2005

FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX,
SCISEARCH' ENTERED AT 11:02:29 ON 27 JUL 2005
           D IBIB ED AB HITIND 2-20
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FILE 'STNGUIDE' ENTERED AT 11:02:32 ON 27 JUL 2005

FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX,
SCISEARCH' ENTERED AT 11:03:12 ON 27 JUL 2005
           D IBIB AB HITIND 21

FILE 'STNGUIDE' ENTERED AT 11:03:30 ON 27 JUL 2005

FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX,
SCISEARCH' ENTERED AT 11:03:55 ON 27 JUL 2005
           D IBIB AB 22-37

FILE 'STNGUIDE' ENTERED AT 11:03:57 ON 27 JUL 2005

FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX,
SCISEARCH' ENTERED AT 11:04:32 ON 27 JUL 2005
           D IALL ABEQ TECH ABEX 38-47

FILE 'STNGUIDE' ENTERED AT 11:04:36 ON 27 JUL 2005

FILE 'HCAPLUS, USPATFULL, WPIX, BIOSIS, PASCAL, JICST-EPLUS, COMPENDEX,
SCISEARCH' ENTERED AT 11:05:12 ON 27 JUL 2005
           D IBIB ED AB HITIND 48-

FILE 'STNGUIDE' ENTERED AT 11:05:17 ON 27 JUL 2005
           D QUE L57
           D QUE L69
           D QUE L97

FILE 'HCAPLUS, USPATFULL, COMPENDEX, SCISEARCH' ENTERED AT 11:06:22 ON 27
JUL 2005
L110          7 DUP REM L57 L69 L97 (0 DUPLICATES REMOVED)
                ANSWERS '1-3' FROM FILE HCAPLUS
                ANSWER '4' FROM FILE USPATFULL
                ANSWER '5' FROM FILE COMPENDEX
                ANSWERS '6-7' FROM FILE SCISEARCH
           D IBIB ED AB HITIND 1-

FILE 'STNGUIDE' ENTERED AT 11:06:48 ON 27 JUL 2005
           D QUE L108

FILE 'HCAPLUS, WPIX' ENTERED AT 11:07:08 ON 27 JUL 2005
           D IBIB ED AB L108 1-

FILE 'STNGUIDE' ENTERED AT 11:07:12 ON 27 JUL 2005

FILE 'STNGUIDE' ENTERED AT 11:07:21 ON 27 JUL 2005
           D QUE L56
           D QUE L57
           D QUE L68
           D QUE L69
           D QUE L77
           D QUE L96
           D QUE L97
           D QUE L108


FILE HOME

FILE ZCAPLUS
```

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FILE LAST UPDATED: 26 Jul 2005 (20050726/ED)

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FILE STNGUIDE
FILE CONTAINS CURRENT INFORMATION.
LAST RELOADED: Jul 22, 2005 (20050722/UP).

FILE WPIX
FILE LAST UPDATED: 25 JUL 2005 <20050725/UP>
MOST RECENT DERWENT UPDATE: 200547 <200547/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE, PLEASE VISIT:
http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE http://thomsonderwent.com/coverage/latestupdates/ <<<

>>> FOR INFORMATION ON ALL DERWENT WORLD PATENTS INDEX USER GUIDES, PLEASE VISIT:
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DOCUMENTATION NOW AVAILABLE IN DERWENT WORLD PATENTS INDEX
FIRST VIEW - FILE WPIFV.
FOR FURTHER DETAILS: http://www.thomsonderwent.com/dwpifv <<<

>>> THE CPI AND EPI MANUAL CODES HAVE BEEN REVISED FROM UPDATE 200501.
PLEASE CHECK:
http://thomsonderwent.com/support/dwpiref/reftools/classification/code-rev
FOR DETAILS. <<<

FILE REGISTRY
Property values tagged with IC are from the ZIC/VINITI data file
provided by InfoChem.

STRUCTURE FILE UPDATES: 26 JUL 2005 HIGHEST RN 857144-48-0
DICTIONARY FILE UPDATES: 26 JUL 2005 HIGHEST RN 857144-48-0

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TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

Please note that search-term pricing does apply when
conducting SmartSELECT searches.

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**************************************************************
*                                                            *
* The CA roles and document type information have been removed from *
* the IDE default display format and the ED field has been added,   *
* effective March 20, 2005.  A new display format, IDERL, is now    *
* available and contains the CA role and document type information. *
*                                                            *
**************************************************************
```

Structure search iteration limits have been increased. See HELP SLIMITS
for details.

Experimental and calculated property data are now available. For more
information enter HELP PROP at an arrow prompt in the file or refer
to the file summary sheet on the web at:
http://www.cas.org/ONLINE/DBSS/registryss.html

FILE USPATFULL
FILE COVERS 1971 TO PATENT PUBLICATION DATE: 26 Jul 2005 (20050726/PD)
FILE LAST UPDATED: 26 Jul 2005 (20050726/ED)
HIGHEST GRANTED PATENT NUMBER: US6922846
HIGHEST APPLICATION PUBLICATION NUMBER: US2005160510
CA INDEXING IS CURRENT THROUGH 26 Jul 2005 (20050726/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 26 Jul 2005 (20050726/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2005
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2005

>>> USPAT2 is now available. USPATFULL contains full text of the <<<
>>> original, i.e., the earliest published granted patents or <<<
>>> applications. USPAT2 contains full text of the latest US <<<
>>> publications, starting in 2001, for the inventions covered in <<<
>>> USPATFULL. A USPATFULL record contains not only the original <<<
>>> published document but also a list of any subsequent <<<
>>> publications. The publication number, patent kind code, and <<<
>>> publication date for all the US publications for an invention <<<
>>> are displayed in the PI (Patent Information) field of USPATFULL <<<
>>> records and may be searched in standard search fields, e.g., /PN, <<<

>>> /PK, etc. <<<

>>> USPATFULL and USPAT2 can be accessed and searched together <<<
>>> through the new cluster USPATALL. Type FILE USPATALL to <<<
>>> enter this cluster. <<<
>>> <<<
>>> Use USPATALL when searching terms such as patent assignees, <<<
>>> classifications, or claims, that may potentially change from <<<
>>> the earliest to the latest publication. <<<

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE USPAT2

FILE COVERS 2001 TO PUBLICATION DATE: 26 Jul 2005 (20050726/PD)
FILE LAST UPDATED: 26 Jul 2005 (20050726/ED)
HIGHEST GRANTED PATENT NUMBER: US2005131306
HIGHEST APPLICATION PUBLICATION NUMBER: US2005160493
CA INDEXING IS CURRENT THROUGH 26 Jul 2005 (20050726/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 26 Jul 2005 (20050726/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2005
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2005

USPAT2 is a companion file to USPATFULL. USPAT2 contains full text of the latest US publications, starting in 2001, for the inventions covered in USPATFULL. USPATFULL contains full text of the original published US patents from 1971 to date and the original applications from 2001. In addition, a USPATFULL record for an invention contains a complete list of publications that may be searched in standard search fields, e.g., /PN, /PK, etc.

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Use USPATALL when searching terms such as patent assignees, classifications, or claims, that may potentially change from the earliest to the latest publication.

FILE BIOSIS
FILE COVERS 1969 TO DATE.
CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNs) PRESENT
FROM JANUARY 1969 TO DATE.

RECORDS LAST ADDED: 21 July 2005 (20050721/ED)

FILE RELOADED: 19 October 2003.

FILE PASCAL
FILE LAST UPDATED: 25 JUL 2005 <20050725/UP>
FILE COVERS 1977 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE
IN THE BASIC INDEX (/BI) FIELD <<<

FILE JICST-EPLUS
FILE COVERS 1985 TO 25 JUL 2005 (20050725/ED)

THE JICST-EPLUS FILE HAS BEEN RELOADED TO REFLECT THE 1999 CONTROLLED TERM (/CT) THESAURUS RELOAD.

FILE COMPENDEX
FILE LAST UPDATED: 25 JUL 2005 <20050725/UP>
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
THE BASIC INDEX >>>

<<< SOME LITTLE CHANGES IN TEXT OF CLASSIFICATION AS OF JUNE 13, 2005
SEE HELP CLA >>>

FILE SCISEARCH

FILE COVERS 1974 TO 22 Jul 2005 (20050722/ED)

SCISEARCH has been reloaded, see HELP RLOAD for details.

FILE MEDLINE
FILE LAST UPDATED: 26 JUL 2005 (20050726/UP). FILE COVERS 1950 TO DATE.

On December 19, 2004, the 2005 MeSH terms were loaded.

The MEDLINE reload for 2005 is now available. For details enter HELP RLOAD at an arrow promt (=>). See also:

http://www.nlm.nih.gov/mesh/
http://www.nlm.nih.gov/pubs/techbull/nd04/nd04_mesh.html

OLDMEDLINE now back to 1950.

MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2005 vocabulary.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE EMBASE
FILE COVERS 1974 TO 21 Jul 2005 (20050721/ED)

EMBASE has been reloaded. Enter HELP RLOAD for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

FILE CONF
FILE LAST UPDATED: 22 JUL 2005 <20050722/UP>
FILE COVERS 1976 TO DATE.

FILE CONFSCI
FILE COVERS 1973 TO 25 May 2005 (20050525/ED)

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